



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

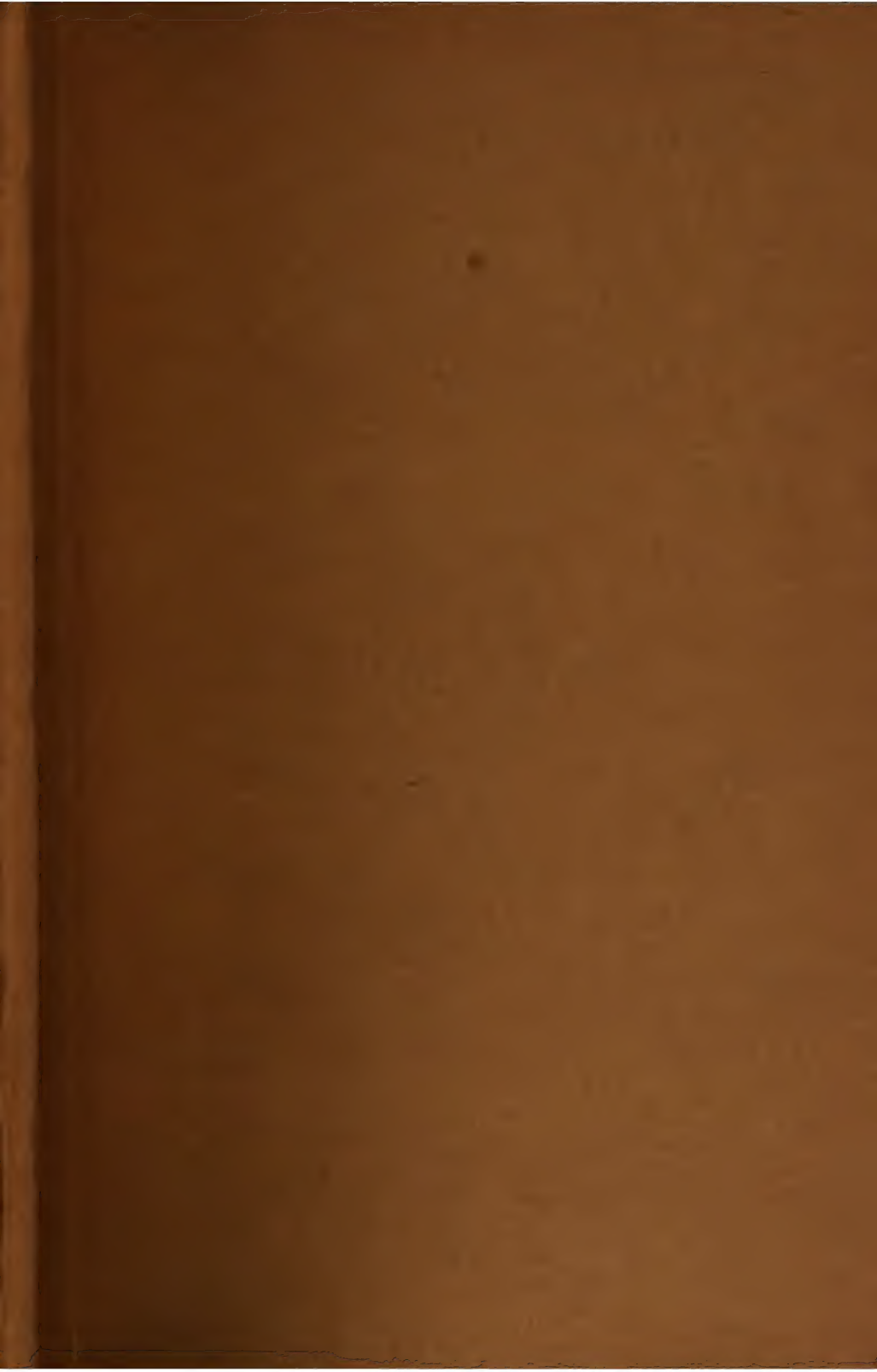
- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

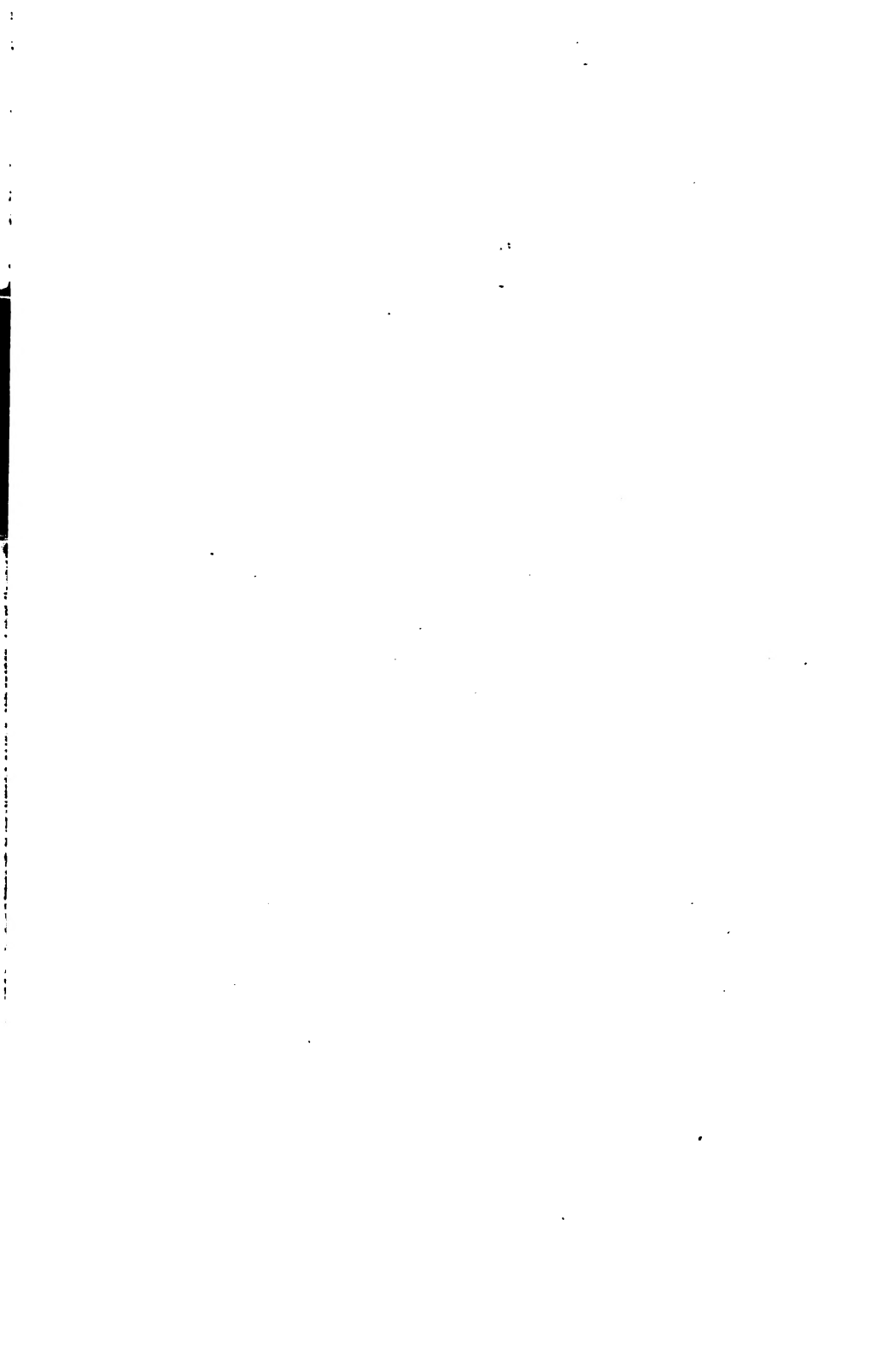
### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

*BOSTON*  
*MEDICAL LIBRARY*  
*8 THE FENWAY.*











**HENRY MARTIN WHITNEY.**

Born at Winchendon, Mass., in 1827. Died at North Andover Depot, Mass, December 2, 1903. President of the American Pharmaceutical Association, 1897-1898. Local Secretary, 1892. Member of the Council, 1892-1895 and 1898-1901.

PROCEEDINGS  
OF THE  
AMERICAN  
PHARMACEUTICAL ASSOCIATION

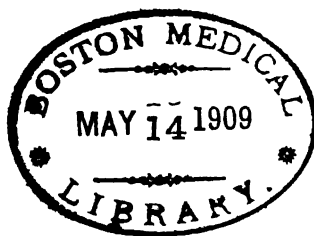
AT THE  
FIFTY-SIXTH ANNUAL MEETING

HELD AT  
HOT SPRINGS, ARK., SEPTEMBER, 1908.

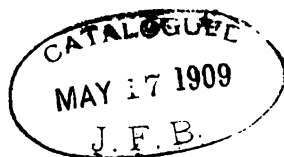
ALSO THE  
CONSTITUTION, BY-LAWS AND ROLL OF MEMBERS.

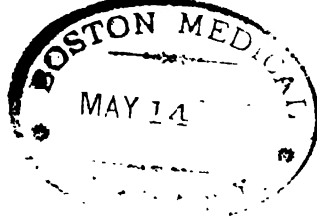


BALTIMORE:  
PUBLISHED BY THE AMERICAN PHARMACEUTICAL ASSOCIATION.  
1908.



2045





# OFFICERS OF THE ASSOCIATION. 1908-1909.

HONORARY PRESIDENT.

S. A. D. SHEPARD.

---

## Notice of Next Annual Meeting

The Fifty-seventh Annual Meeting of the American Pharmaceutical Association will be held at Los Angeles, Cal., beginning at 3 p. m. on Monday, August 16, 1909. Thomas W. Jones, 1726 West 22d Street, Los Angeles, Cal., has been elected local Secretary for this meeting.

CHAS. CASPARI, Jr.,  
General Secretary.

..... ST. LOUIS, MO.

GENERAL SECRETARY.

CHAS. CASPARI JR. .... Baltimore, Md.

REPORTER ON THE PROGRESS OF PHARMACY.

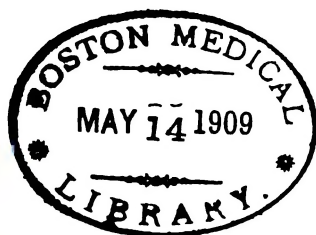
C. LEWIS DIEHL .... Louisville, Ky.

EDITOR OF THE BULLETIN.

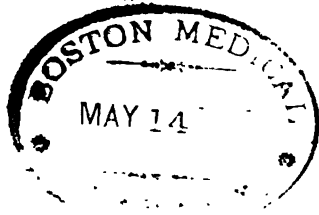
C. S. N. HALLBERG .... Chicago, Ill.

LOCAL SECRETARY.

THOMAS W. JONES .... Los Angeles, Cal.







# OFFICERS OF THE ASSOCIATION.

## 1908-1909.

### HONORARY PRESIDENT.

S. A. D. SHEPPARD . . . . . Boston, Mass.

### PRESIDENT.

OSCAR OLDBERG . . . . . Chicago, Ill.

### FIRST VICE-PRESIDENT.

EUGENE G. EBERLE . . . . . Dallas, Tex.

### SECOND VICE-PRESIDENT.

WM. MITTELBACH . . . . . St. Louis, Mo.

### THIRD VICE-PRESIDENT.

JAMES H. BEAL . . . . . Scio, O.

### TREASURER.

HENRY M. WHELPLEY . . . . . St. Louis, Mo.

### GENERAL SECRETARY.

CHAS. CASPARI Jr. . . . . Baltimore, Md.

### REPORTER ON THE PROGRESS OF PHARMACY.

C. LEWIS DIEHL . . . . . Louisville, Ky.

### EDITOR OF THE BULLETIN.

C. S. N. HALLBERG . . . . . Chicago, Ill.

### LOCAL SECRETARY.

THOMAS W. JONES . . . . . Los Angeles, Cal.

## OFFICERS-ELECT FOR 1909-1910.

In accordance with Chapter I of the By-Laws, an election for four officers of the Association and three members of the Council, for the year 1909-1910, was held by mail during the months of September and October, 1908, and as shown by the report of the Board of Canvassers, hereto attached, the following candidates have received a plurality of the votes cast and are therefore declared elected, the installation to take place at the next annual meeting:

*President*—HENRY H. RUSBY, of New York, N. Y.

*First Vice-President*—CLEMENT B. LOWE, of Philadelphia, Pa.

*Second Vice-President*—CHAS. W. JOHNSON, of Seattle, Wash.

*Third Vice-President*—WILLIAM B. DAY, of Chicago, Ill.

*Members of the Council*—OSCAR OLDBERG, of Chicago, Ill.; CHAS. E. CASPARI, of St. Louis, Mo.; GEORGE M. BERINGER, of Camden, N. J.

CHAS. CASPARI, JR., *General Secretary*.

BALTIMORE, November 16, 1908.

### REPORT OF THE BOARD OF CANVASSERS.

BALTIMORE, MD., November 12, 1908.

CHARLES CASPARI, JR., *General Secretary*.

Your Board of Canvassers, appointed by President Oscar Oldberg, to examine and count the ballots just cast for officers and members of the Council, for 1909-10, begs leave to state that it has fulfilled its duties and is prepared to submit its report, which follows: Total votes cast 879, of which 833 were complete ballots, 30 were partial ballots and 16 were rejected because they were unsigned or failed to signify by any marks the intention of the voter. Of the 863 ballots counted, the following is the summary of the result:

	E. G. Eberle	received 326 votes
For President .....	H. H. Rusby	" 337 "
	A. B. Stevens	" 198 "
	C. B. Lowe	" 491 "
For First Vice-President .....	F. B. Lillie	" 200 "
	F. C. Schachleiter	" 153 "
	C. W. Johnson	" 384 "
For Second Vice-President .....	F. B. Hays	" 256 "
	M. G. Motter	" 207 "
	E. V. Howell	" 258 "
For Third Vice-President.....	W. B. Day	" 348 "
	J. B. Bond	" 242 "
	O. Oldberg	" 626 "
	G. M. Beringer	" 293 "
	C. E. Caspari	" 641 "
	A. M. Roehrig	" 111 "
Members of Council.....	J. W. England	" 250 "
	F. W. R. Perry	" 77 "
	Wm. Mittelbach	" 213 "
	H. B. Mason	" 259 "
	W. L. Dewoody	" 97 "

Very respectfully submitted,

J. F. HANCOCK, *Chairman*; H. P. HYNSON; A. R. L. DOHME, *Secretary*.

# COUNCIL.

## *Term Expires.* MEMBERS OF THE COUNCIL.

1909.	THE OFFICERS OF THE ASSOCIATION,	} <i>Ex-officio.</i>
"	THE CHAIRMEN OF THE FIVE SECTIONS,	
"	THE SECRETARY OF THE COUNCIL,	
"	JOS. L. LEMBERGER .....	Lebanon, Pa.
"	CHAS. E. DOHME .....	Baltimore, Md.
"	JOS. P. REMINGTON .....	Philadelphia, Pa.
"	M. I. WILBERT .....	Philadelphia Branch A. Ph. A.
"	WM. B. DAY .....	Chicago Branch A. Ph. A.
"	F. J. WULLING .....	Northwestern Branch A. Ph. A.
"	OTTO F. CLAUS .....	St. Louis Branch A. Ph. A.
"	D. M. R. CULBRETH .....	Baltimore Branch A. Ph. A.
"	GEORGE H. HITCHCOCK .....	New York Branch, A. Ph. A.
1910.	LEO ELIEL .....	South Bend, Ind.
"	F. W. MEISSNER, JR. ....	La Porte, Ind.
"	FABIUS C. GODBOLD .....	New Orleans, La.
"	ELIE H. LA PIERRE .....	Boston Branch, A. Ph. A.
1911.	HENRY P. HYNSON .....	Baltimore, Md.
"	S. A. D. SHEPPARD .....	Boston, Mass.
"	WM. M. SEARBY .....	San Francisco, Cal.
"	MURRAY GALT MOTTER .....	Washington Branch A. Ph. A.
"	JULIUS A. KOCH .....	Pittsburg Branch A. Ph. A.

## OFFICERS OF THE COUNCIL.

JOSEPH P. REMINGTON, Chairman. WM. M. SEARBY, Vice-Chairman.  
JOSEPH W. ENGLAND, Secretary.

## COMMITTEES OF THE COUNCIL.

### *On Membership :*

WM. MITTELBACH, *Chairman*,  
EUGENE G. EBERLE,  
GEO. H. HITCHCOCK,  
C. S. N. HALLBERG,  
J. L. LEMBERGER,  
LEONARD A. SELTZER,  
F. W. MEISSNER, JR.  
J. W. ENGLAND, *Secretary*.  
THE TREASURER AND GENERAL SECRETARY OF THE ASSOCIATION, *ex-officio*.

### *On Finance :*

JOS. L. LEMBERGER, *Chairman*,  
OTTO F. CLAUS,  
LEO ELIEL.

### *On Publication :*

CHAS. CASPARI, JR., *Chairman*,  
C. LEWIS DIEHL,  
C. S. N. HALLBERG,  
M. I. WILBERT,  
CHAS. E. VANDERKLEED.

### *On Centennial Fund :*

OSCAR OLDBERG, *Chairman*,  
JOS. L. LEMBERGER,  
CHAS. CASPARI, JR.

### *Auditing Committee : (Appointed by the Chairman of the Council.)*

OTTO F. CLAUS, *Chairman*,  
WM. MITTELBACH,  
THOS. KNOEBEL.

## STANDING COMMITTEES OF THE ASSOCIATION.

## COMMITTEE ON THE U. S. PHARMACOPŒIA.

(Appointed by the President.)

E. G. EBERLE (for 1 year).	A. B. LYONS (for 6 years).
E. L. PATCH (for 2 years).	WM. MITTELBACH (for 7 years).
GEO. M. BERINGER (for 3 years).	REID HUNT (for 8 years).
C. S. N. HALLBERG (for 4 years).	L. D. HAVENHILL (for 9 years).
CHAS. E. CASPARI (for 5 years).	L. F. KEBLER (for 10 years).

## COMMITTEE ON NATIONAL AND STATE LEGISLATION.

(Appointed by the President.)

SAMUEL L. HILTON, (Chairman) .....	Washington, D. C.
LYMAN F. KEBLER, Washington, D. C.	CHAS. H. LAWALL, Philadelphia, Pa.
HARRY B. MASON, Detroit, Mich.	WILLARD S. RICHARDSON, Washington.

## COMMITTEE ON TRANSPORTATION.

(Elected by the Council.)

CASWELL A. MAYO (Chairman) .....	New York, N. Y.
C. S. N. HALLBERG, Chicago, Ill.	H. M. WHELPLEY, St. Louis, Mo.
CHAS. M. FORD, Denver, Colo.	WM. M. SEARBY, San Francisco, Cal.
CHAS. G. MERRELL, Cincinnati, O.	F. J. WULLING, Minneapolis, Minn.
JOHN G. GODDING, Boston, Mass.	PHILIP ASHER, New Orleans, La.
W. S. ELKIN, Jr., Atlanta, Ga.	

The General Secretary and the Local Secretary of the Association.

## COMMITTEE ON TIME AND PLACE OF NEXT MEETING.

(Appointed by the President.)

ERNST O. ENGSTROM (Chairman) .....	Pittsfield, Mass.
THOMAS W. JONES, Los Angeles, Cal.	GUSTAVUS LINDVALL, Moline, Ill.
T. ASHBY MILLER, Richmond, Va.	THEODORE D. WETTERSTROEM, Cincinnati.

## COMMITTEE ON THE EBERT PRIZE.

(Appointed by the Chairman of the Section on Scientific Papers.)

CHAS. E. CASPARI (Chairman) .....	St. Louis, Mo.
A. B. STEVENS, Ann Arbor, Mich.	HENRY KRAEMER, Philadelphia.

## COMMITTEE ON COMMERCIAL INTERESTS.

HARRY B. MASON (Chairman) .....	Detroit, Mich.
ERICH H. LADISH (Secretary), Chicago, Ill.	WALDO M. BOWMAN, Toledo, O.
P. HENRY UTECH, Meadville, Pa.	ARTHUR L. CHENEY, Morrisville, Vt.

## COMMITTEE ON SCIENTIFIC PAPERS.

CHAS. E. VANDERKLEED (Chairman) .....	Collingswood, N. J.
MARTIN I. WILBERT (Sec'y), Washington, D. C.	ALBERT H. CLARK, Chicago, Ill.

## COMMITTEE ON HISTORICAL PHARMACY.

JOHN B. BOND (Chairman).....Little Rock, Ark.  
 EUGENE G. EBERLE (Sec'y), Dallas, Tex.     EDW. KREMERS (Historian) Madison, Wis.

## COMMITTEE ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

J. W. ENGLAND (Chairman) .....Philadelphia, Pa.  
 CHAS. H. LA WALL (Sec'y), Philadelphia, Pa.     JULIUS A. KOCH, Pittsburg, Pa.  
 CORNELIUS OSSEWARD, Seattle, Wash.     LEO R. A. SUPPAN, St. Louis, Mo.

## COMMITTEE ON PRACTICAL PHARMACY AND DISPENSING.

LEONARD A. SELTZER, (Chairman).....Detroit, Mich.  
 E. FULLERTON COOK (Secretary) .....Philadelphia, Pa.  
    OTTO RAUBENHEIMER, Brooklyn, N. Y.

## SPECIAL COMMITTEES OF THE ASSOCIATION.

(Appointed by the President.)

## COMMITTEE ON ORGANIZATION OF LOCAL BRANCHES OF THE A. PH. A.

WILLIAM M. SEARBY (Chairman).....San Francisco, Cal.  
 PHILIP ASHER, New Orleans, La.     CORNELIUS OSSEWARD, Seattle, Wash.  
 FRANK A. DRUEHL, Salt Lake City, Utah.     MARTIN I. WILBERT, Washington, D. C.

## COMMITTEE ON PROPOSED PHARMACEUTICAL COLLECTION AT WASHINGTON.

MURRAY GAULT MOTTER (Chairman).....Washington, D. C.  
 LYMAN F. KEBLER, Washington, D. C.     EDWARD KREMERS, Madison, Wis.  
 JOHN U. LLOYD, Cincinnati, O.     MARTIN I. WILBERT, Washington, D. C.

## COMMITTEE ON THE WILLIAM PROCTER, JR., MONUMENT FUND.

JOHN F. HANCOCK (Chairman) .....Baltimore, Md.  
 LEWIS C. HOPP, Cleveland, O.     HENRY KRAEMER, Philadelphia, Pa.  
 BENJ. T. FAIRCHILD, New York, N. Y.     FRANCIS HEMM, St. Louis, Mo.

## COMMITTEE ON PUBLICITY.

FRANCIS B. HAYS (Chairman) .....New York, N. Y.  
 HARRY B. MASON, Detroit, Mich.     CASWELL A. MAYO, New York, N. Y.

## COMMITTEE ON REORGANIZATION.

C. S. N. HALLBERG (Chairman) .....Chicago, Ill.  
 EUG. G. EBERLE, Dallas, Tex.     M. I. WILBERT, Washington, D. C.  
 CASWELL A. MAYO, New York City.     THOMAS V. WOOTEN, Chicago, Ill.

## GENERAL COMMITTEE ON MEMBERSHIP AND RECEPTION.

- WILLIAM B. DAY (Chairman) ..... Chicago, Ill.
- Alabama.* Philip C. Candidus, Mobile.
- Arizona.* Harry Brisley, Prescott.
- Arkansas.* William L. Dewoody, Pine Bluff; Frank Schachleiter, Hot Springs.
- California.* William M. Searby, San Francisco; Valentine Schmidt, San Francisco; Thomas W. Jones, Los Angeles; Walter T. Taylor, Los Angeles.
- Colorado.* George H. Bedard, Boulder; Ferdinand W. Nitardy, Denver.
- Connecticut.* Chas. A. Rapelye, Hartford; Joseph D. Harligan, Bridgeport.
- District of Columbia.* Willard S. Richardson; Martin I. Wilbert.
- Florida.* Henry C. Groves, Ocala; Ernest Berger, Tampa.
- Georgia.* George F. Payne, Atlanta.
- Illinois.* William B. Day, Chicago; Carl S. N. Hallberg, Chicago; Henry F. Schaper, Chicago; Theodore C. Loehr, Carlinville.
- Indiana.* Frank H. Carter, Indianapolis; William J. Coons, Indianapolis; J. Richard Francis, Indianapolis; Leo Eliel, South Bend; Fred. W. Meissner, Jr., La Porte.
- Iowa.* W. J. Teeters, Iowa City; Niels Mikkelsen, Cherokee.
- Kansas.* Lucius E. Sayre, Lawrence; Frederic A. Snow, Topeka.
- Kentucky.* John W. Gayle, Frankfort; Simon N. Jones, Louisville.
- Louisiana.* Fabius C. Godbold, New Orleans; Michael T. Breslin, New Orleans; Philip Asher, New Orleans.
- Maine.* Alfred P. Cook, Portland; Oscar Winthrop Jones, Auburn.
- Maryland.* Henry P. Hynson, Baltimore. E. Frank Kelly, Baltimore; Robert S. McKinney, Taneytown.
- Massachusetts.* John G. Godding, Boston; Arthur H. Tripp, Dorchester Center; James F. Guerin; Worcester; William H. Glover, Lawrence.
- Michigan.* Frederick W. R. Perry, Detroit; Leonard A. Seltzer, Detroit; James W. T. Knox, Detroit; Wilbur L. Scoville, Detroit; Alviso B. Stevens, Ann Arbor; William C. Kirchgessner, Grand Rapids.
- Minnesota.* Frederick J. Wulling, Minneapolis; Albert D. Thompson, Minneapolis; William A. Frost, St. Paul.
- Mississippi.* Oscar W. Bethea, Meridian; Milton W. Hyde, Ellisville.
- Missouri.* Henry M. Whelpley, St. Louis; Otto F. Claus, St. Louis; Wm. Mittelbach, Boonville; Joseph C. Wirthman, Kansas City.
- Montana.* Howard Rockefeller, Butte; Lee Warren, Billings.
- Nebraska.* Charles R. Sherman, Omaha; Autumn V. Pease, Fairbury.
- New Hampshire.* William D. Grace, Portsmouth; S. Howard Bell, West Derby.
- New Jersey.* George M. Beringer, Camden; Charles Holzhauer, Newark; Frank C. Stutzlen, Elizabeth.
- New York.* George C. Diekman, New York City; Joseph Weinstein, New York City; William C. Alpers, New York City; Caswell A. Mayo, New York City; William Muir, Brooklyn; George Reimann, Buffalo; Warren L. Bradt, Albany.
- North Carolina.* Parry W. Vaughan, Durham; Caleb D. Bradham, Newbern; Edward V. Howell, Chapel Hill.
- Ohio.* Harry Vin Army, Cleveland; William T. Hankey, Cleveland; Theodore D. Wetterstroem, Cincinnati; George B. Kauffman, Columbus.
- Oklahoma.* Fores B. Lillie, Guthrie.
- Oregon.* John M. A. Laue, Portland.
- Pennsylvania.* Joseph W. England, Philadelphia; William L. Cliffe, Philadelphia; William McIntyre, Philadelphia; E. Fullerton Cook, Philadelphia; Julius A. Koch, Pittsburg.
- Rhode Island.* William O. Blanding, Providence; James O'Hare, Providence.
- South Dakota.* Irwin A. Keith, Lake Preston; Edward C. Bent, Dell Rapids.
- Tennessee.* John T. McGill, Nashville; Joseph F. Voigt, Chattanooga.
- Texas.* Eugene G. Eberle, Dallas; Robert H. Walker, Gonzales.
- Utah.* Frank A. Druehl, Salt Lake City; Otto R. Peters, Salt Lake City.

GENERAL COMMITTEE ON MEMBERSHIP AND RECEPTION—*Concluded.*

<i>Vermont.</i> Elbridge W. Gilman, Marsh- field; Willis E. Terrill, Montpelier.	<i>West Virginia.</i> John Coleman, Wheeling, William C. Gordon, Wheeling.
<i>Virginia.</i> William R. Martin, Norfolk; Ernest L. Brandis, Richmond.	<i>Wisconsin.</i> Henry C. Ruenzel, Milwaukee, Edward Williams, Madison; Edward S. Hebbard, LaCrosse.
<i>Washington.</i> George O. Guy, Seattle; Cornelius Osseward, Seattle; George H. Watt, Pullman.	

## COMMITTEE ON WEIGHTS AND MEASURES.

EDWARD KREMERS (Chairman) .....	Madison, Wis.
WILLIAM C. ALPERS, New York, N. Y.	CHAS. E. CASPARI, St. Louis, Mo.
ALBERT B. LYONS, Detroit, Mich.	OTTO A. WALL, St. Louis, Mo.

COMMITTEE ON STATUS OF PHARMACISTS IN THE ARMY, NAVY, AND  
PUBLIC HEALTH AND MARINE HOSPITAL SERVICE OF THE  
UNITED STATES.

WILLARD S. RICHARDSON (Chairman).....	Washington, D. C.
A. R. L. DOHME, Baltimore, Md.	FRANK C. HENRY, Washington, D. C.
SAMUEL L. HILTON, Washington, D. C.	CLEMENT B. LOWE, Philadelphia, Pa.

## COMMITTEE ON RELATIONS OF THE A. Ph. A. TO THE N. A. R. D.

JAMES H. BEAL (Chairman).....	Scio, Ohio.
HENRY P. HYNSON, Baltimore, Md.	HENRY M. WHELFLEY, St. Louis, Mo.

## COMMITTEE ON PARCELS POST.

HERMAN D. KNISELEY (Chairman).....	Checotah, Okla.
WILLIAM MITTELBACH, Boonville, Mo.	AUTUMN V. PEASE, Fairbury, Neb.

## COMMITTEE ON THE BULLETIN.

FREDERICK J. WULLING (Chairman) .....	Minneapolis, Minn.
JAMES H. BEAL, Scio, O.	THOMAS D. McELHENIE, Brooklyn, N. Y.
GEORGE M. BERINGER, Camden, N. J.	JOSEPH W. ENGLAND, Philadelphia, Pa.
The Editor of the Bulletin <i>ex-officio</i> .	

## COMMITTEE ON PATENTS AND TRADE-MARKS.

(To co-operate with a similar committee of the A. M. A.)

THOMAS V. WOOTEN (Chairman) .....	Chicago, Ill.
FRANKLIN M. APPLE, Philadelphia, Pa.	F. W. MEISSNER, JR., LaPorte, Ind.
FREDERICK M. SCHMIDT, Chicago, Ill.	FRANCIS E. STEWART, Philadelphia, Pa.

## COMMITTEE ON DRUG REFORM.

(To co-operate with a similar committee of the A. M. A.)

C. LEWIS DIEHL (Chairman) .....	Louisville, Ky.
C. S. N. HALLBERG, Chicago, Ill.	MARTIN I. WILBERT, Washington, D. C.

## COMMITTEE ON DRUG MARKET.

(Appointed by the Chairman of the Section on Scientific Papers.)

E. L. PATCH (Chairman) .....	Stoneham, Mass.
E. H. GANE, Secretary, New York City.	H. H. RUSBY, New York City.
W. L. SCOVILLE, Detroit, Mich.	L. F. KEBLER, Washington, D. C.

## COMMITTEE ON THE NATIONAL FORMULARY.

(Elected by the Council.)

C. LEWIS DIEHL (Chairman) .....	Louisville, Ky.
C. S. N. HALLBERG, Chicago, Ill.	HENRY P. HYNSON, Baltimore, Md.
A. B. STEVENS, Ann Arbor, Mich.	CHAS. H. LA WALL, Philadelphia, Pa.
HARRY V. ARNY, Cleveland, O.	GEORGE M. BERINGER, Camden, N. J.
E. FULLERTON COOK, Philadelphia, Pa.	H. A. B. DUNNING, Baltimore, Md.
LEO ELIEL, South Bend, Ind.	WILLIAM A. HALL, Detroit, Mich.
OTTO RAUBENHEIMER, Brooklyn, N. Y.	WILBUR L. SCOVILLE, Detroit, Mich.
LEONARD A. SELTZER, Detroit, Mich.	MARTIN I. WILBERT, Washington, D. C.

COMMITTEE ON STANDARDS FOR NON-OFFICIAL DRUGS AND  
CHEMICAL PRODUCTS.

(Elected by the Council.)

GEORGE M. BERINGER (Chairman) .....	Camden, N. J.
THOMAS P. COOK, New York, N. Y.	JOHN M. FRANCIS, Detroit, Mich.
CHAS. E. VANDERKLEED, Collingswood, N. J.	GEORGE B. KAUFFMAN, Columbus, O.
MAHLON N. KLINE, Philadelphia, Pa.	HENRY P. HYNSON, Baltimore, Md.
GEORGE D. ROSENGARTEN, Philadelphia, Pa.	OTTO RAUBENHEIMER, Brooklyn, N. Y.
JAMES M. GOOD, St. Louis, Mo.	LEO ELIEL, South Bend, Ind.
RICHARD FISCHER, Madison, Wis.	CHAS. E. CASPARI, St. Louis, Mo.
WILLIAM A. PUCKNEB, Chicago, Ill.	JULIUS A. KOCH, Pittsburg, Pa.

DELEGATES TO THE SECTION ON PHARMACOLOGY OF THE AMERICAN  
MEDICAL ASSOCIATION.

GEORGE M. BERINGER (Chairman) .....	Camden, N. J.
HENRY H. RUSBY, New York, N. Y.	CHAS. CASPARI, JR., Baltimore, Md.
WILLIAM C. ALPERS, New York, N. Y.	C. LEWIS DIEHL, Louisville, Ky.
JOSEPH W. ENGLAND, Philadelphia, Pa.	HENRY KRAEMER, Philadelphia, Pa.
EDWARD KREMERS, Madison, Wis.	JOSEPH P. REMINGTON, Philadelphia, Pa.
	MARTIN I. WILBERT, Washington, D. C.

## DELEGATES TO THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

HENRY P. HYNSON (Chairman) .....	Baltimore, Md.
HARRY B. MASON, Detroit, Mich.	CHAS. LEEDOM, Philadelphia, Pa.
W. L. CLIFFE, Philadelphia, Pa.	F. W. MEISSNER, JR., La Porte, Ind.

## DELEGATES TO THE NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

GEORGE M. BERINGER (Chairman) .....	Camden, N. J.
J. P. REMINGTON, Philadelphia, Pa.	JAS. H. BEAL, Scio, Ohio.
KLIN M. APPLE, Philadelphia, Pa.	CASWELL A. MAYO, New York, N. Y.



LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION.  
(DECEASED IN ITALICS.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852..	Philadelphia, Pa.....	<i>Daniel B. Smith,</i> Philadelphia.	<i>George W. Andrews,</i> Baltimore.	<i>Samuel M. Colcord,</i> Boston.	<i>C. Augustus Smith,</i> Cincinnati.
Aug. 24, 1853..	Boston, Mass.....	<i>William A. Brewer,</i> Boston.	<i>George D. Coggeshall,</i> New York.	<i>Alexander Duval,</i> Richmond, Va.	Charles B. Guthrie, Memphis, Tenn.
July 25, 1854..	Cincinnati, O.....	<i>William B. Chapman,</i> Cincinnati.	<i>Henry T. Cummings,</i> Port and, Me.	<i>John Meakin,</i> New York.	<i>Joseph Latley,</i> Richmond, Va.
Sept. 11, 1855..	New York, N. Y.....	<i>John Meakin,</i> New York.	Charles B. Guthrie, Memphis, Tenn.	<i>Charles Ellis,</i> Philadelphia.	<i>Henry F. Fish,</i> Waterbury, Conn.
Sept. 9, 1856..	Baltimore, Md.....	<i>George W. Andrews,</i> Baltimore.	<i>John L. Kidwell,</i> Washington, D. C.	<i>Frederick Stearns,</i> Detroit, Mich.	<i>Henry T. Kiersted,</i> New York.
Sept. 8, 1857..	Philadelphia, Pa.....	<i>Charles Ellis,</i> Philadelphia.	<i>James Cooke,</i> Fredericksburg, Va.	<i>Samuel P. Peck,</i> Bennington, Vt.	A. E. Richards, Plaquemine, La.
Sept. 14, 1858..	Washington, D. C....	<i>John L. Kidwell,</i> Georgetown, D. C.	<i>Edward R. Squibb,</i> Brooklyn, N. Y.	<i>James O'Gallagher,</i> St. Louis.	Robert Battey, Rome, Ga.
Sept. 13, 1859..	Boston, Mass.....	<i>Samuel M. Colcord,</i> Boston.	<i>William Procter, Jr.,</i> Philadelphia.	<i>Joseph Roberts,</i> Baltimore.	Edwin O. Gale, Chicago.
Sept. 11, 1860..	New York, N. Y.....	<i>Henry T. Kiersted,</i> New York.	William J. M. Gordon, Cincinnati.	<i>William S. Thompson,</i> Baltimore.	<i>Theodore Metcalf,</i> Boston.
Aug. 27, 1862..	Philadelphia, Pa....	<i>Wm. Procter, Jr.,</i> Philadelphia.	<i>John Milneau,</i> New York.	<i>Eugene L. Masot,</i> St. Louis.	<i>J. Faris Moore,</i> Baltimore.
Sept. 8, 1863..	Baltimore, Md.....	<i>J. Faris Moore,</i> Baltimore.	<i>John M. Maitch,</i> Philadelphia.	<i>Chas. A. Twyts,</i> Dover, N. H.	George W. Weyman, Pittsburg.
Sept. 21, 1864..	Cincinnati, O.....	William J. M. Gordon, Cincinnati.	<i>Richard H. Stabler,</i> Alexandria.	Enno Sander, St. Louis.	<i>Thomas Hollis,</i> Boston.

## LIST OF OFFICERS (Continued).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1865..	Boston, Mass.....	<i>Henry W. Lincoln</i> , Boston.	<i>George C. Close</i> , Brooklyn, N. Y.	<i>Elijah W. Sackrider</i> , Cleveland, O.	<i>Charles A. Heinisch</i> , Lancaster, Pa.
Aug. 22, 1866..	Detroit, Mich.....	<i>Frederick Stearns</i> , Detroit, Mich.	<i>Edward Parrish</i> , Philadelphia.	<i>Eschiel H. Sargent</i> , Chicago.	<i>John W. Shedd</i> , New York.
Sept. 10, 1867..	New York, N. Y.....	<i>John Milhan</i> , New York.	<i>Robert J. Brown</i> , Leavenworth, Kan.	<i>N. Hynson Jennings</i> , Baltimore.	<i>Daniel Henchman</i> , Boston.
Sept. 8, 1868..	Philadelphia, Pa.....	<i>Edward Parrish</i> , Philadelphia.	<i>Ferris Bringhurst</i> , Wilmington, Del.	<i>Edward S. Wayne</i> , Cincinnati.	<i>Albert E. Ebert</i> , Chicago.
Sept. 7, 1869..	Chicago, Ill.....	<i>Eschiel H. Sargent</i> , Chicago.	<i>Ferdinand W. Sennewald</i> , St. Louis.	<i>John H. Pope</i> , New Orleans.	<i>Joel S. Orne</i> , Cambridgeport, Mass.
Sept. 13, 1870..	Baltimore, Md. ....	<i>Richard H. Stabler</i> , Alexandria, Va.	<i>Fleming G. Grieve</i> , Milledgeville, Ga.	<i>James G. Steele</i> , San Francisco.	<i>Eugene L. Mason</i> , St. Louis.
Sept. 12, 1871..	St. Louis, Mo.....	<i>Enno Sander</i> , St. Louis.	<i>C. Lewis Diehl</i> , Louisville, Ky.	<i>George F. H. Markoe</i> , Boston.	<i>Matthew F. Ash</i> , Jackson, Miss.
Sept. 3, 1872..	Cleveland, O. ....	<i>Albert E. Ebert</i> , Chicago.	<i>Samuel S. Garrigue</i> , East Saginaw, Mich.	<i>Edward P. Nichols</i> , Newark, N. J.	<i>Henry C. Gaylord</i> , Cleveland, O.
Sept. 16, 1873..	Richmond, Va.....	<i>John F. Hancock</i> , Baltimore.	<i>William Saunders</i> , London, Ont.	<i>John T. Buck</i> , Jackson, Miss.	<i>Paul Balluff</i> , New York.
Sept. 8, 1874..	Louisville, Ky.....	<i>C. Lewis Diehl</i> , Louisville, Ky.	<i>Joseph Roberts</i> , Baltimore.	<i>William T. Wenzell</i> , San Francisco.	<i>Augustus R. Bayler</i> , Cambridgeport, Mass.
Sept. 7, 1875..	Boston, Mass.....	<i>George F. H. Markoe</i> , Boston.	<i>Frederick Hoffmann</i> , New York.	<i>T. Roberts Baker</i> , Richmond, Va.	<i>Christian F. G. Meyer</i> , St. Louis.
Sept. 12, 1876..	Philadelphia, Pa.....	<i>Charles Bullock</i> , Philadelphia.	<i>Samuel A. D. Sheppard</i> , Boston.	<i>Gustavus J. Luhn</i> , Charleston, S. C.	<i>Jacob D. Wells</i> , Cincinnati.
Sept. 4, 1877..	Toronto, Can.....	<i>William Saunders</i> , London, Ont.	<i>Ewen McIntyre</i> , New York.	<i>John Ingalls</i> , Macon, Ga.	<i>Emeline Painter</i> , San Francisco.

## LIST OF OFFICERS (Continued).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Nov. 26, 1878..	Atlanta, Ga.....	<i>Gustavus J. Luhn</i> , Charleston, S. C.	<i>Frederick T. Whiting</i> , Great Barrington, Mass.	Henry J. Rose, Toronto, Can.	<i>William H. Crawford</i> , St. Louis.
Sept. 9, 1879..	Indianapolis, Ind....	<i>George W. Sloan</i> , Indianapolis, Ind.	<i>T. Roberts Baker</i> , Richmond, Va.	Joseph L. Lemberger, Lebanon, Pa.	Philip C. Candidus, Mobile, Ala.
Sept. 14, 1880..	Saratoga, N. Y. ....	<i>James T. Shinn</i> , Philadelphia.	George H. Schafer, Fort Madison, a.	<i>William S. Thompson</i> , Washington, D. C.	<i>William Simpson</i> , Kaleigh, N. C.
Aug. 23, 1881..	Kansas City, Mo....	<i>P. Wendover Bedford</i> , New York.	<i>Emlen Painter</i> , San Francisco.	George Leis, Lawrence, Kan.	<i>John F. Judge</i> , Cincinnati.
Sept. 12, 1882..	Niagara Falls, N. Y.	<i>Charles A. Heinisch</i> , Lancaster, Pa.	<i>John Ingalls</i> , Macon, Ga.	Louis Dohme, Baltimore,	<i>William B. Blanding</i> , Providence, R. I.
Sept. 11, 1883..	Washington, D. C....	<i>William S. Thompson</i> , Washington, D. C.	<i>Charles Rice</i> , New York.	<i>Frederick H. Masi</i> , Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884..	Milwaukee, Wis.....	<i>John Ingalls</i> , Macon, Ga.	<i>John A. Dadd</i> , Milwaukee, Wis.	<i>Henry Canning</i> , Boston.	<i>Charles F. Goodman</i> , Omaha, Neb.
Sept. 8, 1885..	Pittsburgh, Pa.....	<i>Joseph Roberts</i> , Baltimore.	Albert H. Hollister, Madison, Wis.	<i>Albert B. Prescott</i> , Ann Arbor, Mich.	Joseph S. Evans, West Chester, Pa.
Sept. 7, 1886..	Providence, R. I....	<i>Chas. A. Tufts</i> , Dover, N. H.	<i>Henry J. Messenger</i> , Brooklyn, N. Y.	<i>M. W. Alexander</i> , St. Louis.	Norman A. Kuhn, Omaha, Neb.
Sept. 5, 1887..	Cincinnati, O.....	John U. Lloyd, Cincinnati.	<i>M. W. Alexander</i> , St. Louis.	A. K. Finlay, New Orleans.	Karl Simmon, St. Paul, Minn.
Sept. 3, 1888..	Detroit, Mich.....	<i>M. W. Alexander</i> , St. Louis.	Jas. Vernor, Detroit, Mich.	<i>Fred. Wilcox</i> , Waterbury, Conn.	Alvin A. Yeager, Knoxville, Tenn.
June 24, 1889..	San Francisco, Cal...	<i>Emlen Painter</i> , New York.	Karl Simmon, St. Paul, Minn.	Wm. M. Searby, San Francisco.	Joa. W. Eckford, Aberdeen, Miss.
Sept. 8, 1890..	Old Pt. Comfort, Va.	<i>A. B. Taylor</i> , Philadelphia.	A. B. Stevens, Ann Arbor, Mich.	Chas. E. Dohme, Baltimore.	Jas. M. Good, St. Louis.

## LIST OF OFFICERS (Continued.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
April 27, 1891..	New Orleans, La....	A. K. Finlay, New Orleans.	<i>Geo. F. Seabury</i> , New York.	W. H. Torbert, Dubuque, Ia.	L. T. Dunning, Sioux Falls, S. Dak.
July 14, 1892..	Profile House, N. H.	Jos. P. Remington, Philadelphia.	A. P. Preston, Portsmouth, N. H.	<i>Sidney P. Watson</i> , Atlanta, Ga.	<i>Wm. H. Auerill</i> , Frankfort, Ky.
Aug. 14, 1893..	Chicago, Ill.....	Edgar L. Patch, Boston.	Leo Ethel, South Bend, Ind.	Wiley Rogers, Louisville, Ky.	Chas. Caspari, Jr., Baltimore.
Sept. 3, 1894..	Asheville, N. C.....	<i>William Simpson</i> . Raleigh, N. C.	Chas. M. Ford, Denver, Colo.	Jno. N. Hurty, Indianapolis, Ind.	Jos. E. Morrison, Montreal, Can.
Aug. 14, 1895..	Denver, Colo.....	James M. Good, St. Louis.	Chas. E. Dohme, Baltimore.	Adolph Brandenberger, Jefferson City, Mo.	Mrs. M. O. Miner, Hiawatha, Kan.
Aug. 12, 1896..	Montreal, Can.....	Joseph E. Morrison, Montreal, Can.	Geo. F. Payne, Atlanta, Ga.	Wm. A. Frost, St. Paul, Minn.	Geo. W. Parisen, PettibAmboy, N. J.
Aug. 23, 1897..	Lake Minnetonka. }	<i>Henry M. Whitney</i> , Lawrence, Mass.	George C. Bartells, Camp Point, Ill.	<i>Wm. S. Thompson</i> , Washington, D. C.	<i>Jacob A. Miller</i> , Harrisburg, Pa.
Aug. 29, 1898..	Baltimore, Md.....	Charles E. Dohme, Baltimore.	George F. Payne, Atlanta, Ga.	James H. Beal, Scio, O.	Miss Josie A. Wanous, Minneapolis, Minn.
Sept. 4, 1899..	Put-in-Bay, O.....	<i>Albert B. Prescott</i> , Ann Arbor, Mich.	Lewis C. Hopp, Cleveland, O.	Wm. L. Dewoody, Pine Bluff, Ark.	Henry R. Gray, Montreal, Can.
May 7, 1900..	Richmond, Va.....	Jno. F. Patton, York, Pa.	James H. Beal, Scio, O.	Jno. W. Gayle, Frankfort, Ky.	E. A. Ruddiman, Nashville, Tenn.
Sept. 16, 1901..	St. Louis, Mo.....	Henry M. Whelpley, St. Louis.	Wm. M. Searby, San Francisco.	George F. Payne, Atlanta, Ga.	<i>Wm. S. Thompson</i> , Washington, D. C.
Sept. 8, 1902..	Philadelphia, Pa....	Geo. F. Payne, Atlanta, Ga.	Wm. L. Cliffe, Philadelphia, Pa.	Eugene G. Eberle, Dallas, Tex.	Henry Willis, Quebec, Can.
Aug. 3, 1903..	Mackinac Island, Mich.....	Lewis C. Hopp, Cleveland, O.	Wm. C. Alpers, New York, N. Y.	Albert M. Rochrig, Stapleton, N. Y.	Otto F. Claus, St. Louis, Mo.

## LIST OF OFFICERS (Concluded.)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1904...	Kansas City, Mo....	James H. Beal, Scio, O.	Philip C. Candidus, Mobile, Ala.	Wm. Mittelbach, Boonville, Mo.	Julius A. Koch, Pittsburg, Pa.
Sept. 4, 1905...	Atlantic City, N. J....	Jos. L. Lemberger, Lebanon, Pa.	Chas. Holzhauer, Newark, N. J.	Chas. A. Rapelye, Hartford, Conn.	Fabius C. Godbold, New Orleans, La.
Sept. 3, 1906...	Indianapolis, Ind....	Leo Eliel, South Bend, Ind.	Wm. Mittelbach, Boonville, Mo.	C. S. N. Hallberg, Chicago, Ill.	Thomas P. Cook, New York, N. Y.
Sept. 2, 1907...	New York, N. Y....	Wm. M. Seaby, San Francisco, Cal.	Oscar Oldberg, Chicago, Ill.	Henry H. Rusby, New York, N. Y.	Oscar W. Bethea, Meridian, Miss.
Sept. 7, 1908...	Hot Springs, Ark...	Oscar Oldberg, Chicago, Ill.	Eugene G. Eberle, Dallas, Tex.	Wm. Mittelbach, Boonville, Mo.	James H. Beal, Scio, O.

## HONORARY PRESIDENTS.

Philip C. Candidus, Mobile, Ala., 1907-08.

## TREASURERS.

*Alfred B. Taylor*, Philadelphia, 1852-54.  
*Samuel M. Colcord*, Boston, 1854-56, and  
 1857-59.  
*James S. Aspinwall*, New York, 1856-57.

Samuel A. D. Sheppard, Boston, Mass., 1908-09.

*Charles A. T'wiss*, Dover, N. H., 1865-86.  
*Samuel A. D. Sheppard*, Boston, 1886-1908.  
*Henry M. Whelpley*, St. Louis, 1908-1909.

## RECORDING SECRETARIES.

*George D. Coggeshall*, New York, 1852-53.  
*Edward Parrish*, Philadelphia, 1853-54.  
*Edward S. Wayne*, Cincinnati, 1854-55.

*Peter W. Bedford*, New York, 1862-63.  
*William Evans, Jr.*, Philadelphia, 1863-64.  
*Henry N. Rittenhouse*, Philadelphia, 1864-65.

## CORRESPONDING SECRETARIES.

*William Porter, Jr.*, 1852-53, and  
 1854-57.  
*William B. Chapman*, Cincinnati, 1853-1854.

*Peter W. Bedford*, New York, 1860-62, and 1863-65.  
*John M. Matich*, Philadelphia, 1862-63.

## PERMANENT SECRETARIES.

*John M. Maisch*, Philadelphia, 1865-Sept., 1893.

*Henry M. Whelpley*, St. Louis (acting), August, 1893.

*Joseph P. Remington*, Philadelphia, 1893-94.  
*Chas. Caspari Jr.*, Baltimore, 1894-96.

## GENERAL SECRETARY.

*Chas. Caspari Jr.*, Baltimore, 1896-1909.

## LOCAL SECRETARIES.

For the meeting held in

1867.....*P. Wendover Bedford*.  
1868.....*Alfred B. Taylor*.  
1869.....*Henry W. Fuller*.  
1870.....*J. Faris Moore*.  
1871.....*William H. Crawford*.  
1872.....*Henry C. Gaylord*.  
1873.....*Thomas H. Hazard*.  
1874.....*Emil Schaffer*.  
1875.....*Samuel A. D. Sheppard*.  
1876.....*Adolphus W. Miller*.  
1877.....*Henry J. Rose*.  
1878.....*Jesse W. Rankin*.  
1879.....*Eli Lilly*.  
1880.....*Charles F. Fish*.

For the meeting held in

1881.....*William T. Ford*.  
1882.....*Hiram E. Griffith*.  
1883.... *Charles Becker*.  
1884.....*Henry C. Schranck*.  
1885.....*George A. Kelly*.  
1886.....*William B. Blanding*.  
1887.....*George W. Voss*.  
1888.....*James Vernor*.  
1889.....*Edward W. Runyon*.  
1890.....*Charles E. Dohme*.  
1891.....*A. K. Finlay*.  
1892.....*H. M. Whitney*.  
1893.....*Henry Biroth*.  
1894.....*W. G. Smith*.

For the meeting held in

1895.....*Edm. L. Scholtz*.  
1896.....*Joseph E. Morrison*.  
1897.....*Edw. Shumpik*.  
1898.....*Henry P. Hynson*.  
1899.....*Lewis C. Hopp*.  
1900.....*T. Ashby Miller*.  
1901.....*H. M. Whelpley*.  
1902.....*Wm. L. Cliffe*.  
1903.....*F. W. R. Perry*.  
1904.... *Joseph C. Wirthman*.  
1905.....*Wm. C. Wescott*.  
1906.... *Frank H. Carter*.  
1907.....*Thos. P. Cook*.  
1908.....*Martin A. Eisele*.

## REPORTERS ON PROGRESS OF PHARMACY.

*C. L. Diehl*, Louisville, Ky., 1873-91, and 1895-1909.

*Chas. Rice*, New York, N. Y., 1891-92.

*Henry Kraemer*, Philadelphia, Pa., 1892-95.

## OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.

	<i>Chairman.</i>	<i>Vice-Chairman.</i>	<i>Secretary.</i>
1880-81.....	Jos. P. Remington.	<i>Joseph Roberts.</i>	<i>Geo. W. Kennedy.</i>
1881-82.....	"	Wm. J. M. Gordon.	"
1882-83.....	"	"	"
1883-84.....	"	C. Lewis Diehl.	"
1884-85.....	"	<i>John A. Dadd.</i>	"
1885-86.....	"	C. Lewis Diehl.	"
1886-87.....	<i>Wm. S. Thompson.</i>	<i>H. J. Menninger.</i>	"
1887-88.....	Wm. H. Rogers.	Karl Simmon.	"
1888-89.....	Jas. M. Good.	<i>Emilen Painter.</i>	"
1889-90.....	"	<i>Wm. S. Thompson.</i>	"
1890-91.....	"	"	"
1891-92.....	"	"	"
1892-93.....	"	<i>H. M. Whitney.</i>	"
1893-94.....	"	"	"
1894-95.....	<i>Wm. S. Thompson.</i>	"	"
1895-96.....	"	"	"
1896-97.....	"	Wm. C. Alpers.	"
1897-98.....	"	Jas. M. Good.	"
1898-99.....	"	"	"
1899-00.....	"	"	"
1900-01.....	"	"	"
1901-02.....	<i>A. B. Prescott.</i>	Chas. E. Dohme.	"
1902-03.....	James H. Beal.	Lewis C. Hopp.	Henry M. Wheelpley.
1903-04.....	"	Leo Eliel.	"
1904-05.....	"	Jos. L. Lemberger.	"
1905-06.....	"	Wm. C. Alpers.	"
1906-07.....	"	Albert M. Reehrig.	"
1907-08.....	"	"	"
1908-09.....	Jos. P. Remington.	Wm. M. Searby.	Jos. W. England.

## PAST AND PRESENT OFFICERS OF THE SECTIONS.

## SECTION ON COMMERCIAL INTERESTS.

<i>Chairman.</i>	<i>Secretary.</i>
1887-88..... A. H. Hollister.	J. W. Colcord.
1888-89..... "	"
1889-90..... Leo Eliel.	F. B. Kilmer.
1890-91..... Henry Canning.	W. L. Dewood.
1891-92..... W. H. Torbert.	Arthur Bassett.
1892-93..... "	"
1893-94..... Wiley Rogers.	Jas. O. Burge.
1894-95..... Geo. J. Seabury.	"
1895-96..... "	Clay W. Holmes.
1896-97..... Lewis C. Hopp.	E. D'Avignon.
1897-98..... Joseph Jacobs.	Jas. H. Bobbitt.
1898-99..... "	"
1899-00..... Jas. M. Good.	Chas. A. Rapelye.
1900-01..... Chas. A. Rapelye.	F. W. Meisner.
1901-02..... F. W. Meisner.	E. G. Eberle.
1902-03..... Thos. V. Wooten.	Wm. C. Anderson.
1903-04..... Wm. L. Dewood.	Robert C. Reilly.
1904-05..... Chas. R. Sherman.	"
1905-06..... Henry P. Hynson.	Herman D. Kniseley.
1906-07..... Herman D. Kniseley.	Chas. H. Avery.
1907-08..... Jacob Diner.	George O. Young.
1908-09..... Harry B. Mason.	Erich H. Ladish.

## SECTION ON PHARMACEUTICAL EDUCATION.

<i>Chairman.</i>	<i>Secretary.</i>
1887-88..... John F. Judge.	H. M. Whelpley.
1888-89..... P. W. Bedford.	L. E. Sayre.

## SECTION ON SCIENTIFIC PAPERS.

<i>Chairman.</i>	<i>Secretary.</i>
1887-88..... T. Roberts Baker.	A. B. Lyons.
1888-89..... Emilyn Painelet.	H. M. Whelpley.
1889-90..... H. M. Whelpley.	C. F. Dare.
1890-91..... E. L. Patch.	C. S. N. Hallberg.
1891-92..... C. S. N. Hallberg.	H. W. Snow.
1892-93..... C. T. P. Fennel.	F. G. Ryan.
1893-94..... L. E. Sayre.	C. M. Ford.
1894-95..... A. R. L. Dohme.	Geo. B. Kauffman.
1895-96..... S. P. Sadler.	W. C. Alpers.
1896-97..... W. C. Alpers.	V. Coblentz.
1897-98..... Edward Kremers.	A. B. Lyons.
1898-99..... Henry H. Rusby.	H. V. Army.
1899-00..... Frank G. Ryan.	Caswell A. Mayo.
1900-01..... Oscar Oldberg.	Lyman F. Kebler.
1901-02..... Lyman F. Kebler.	Jos. W. England.
1902-03..... J. O. Schlotterbeck.	"
1903-04..... Wm. A. Puckner.	Eustace H. Gane.
1904-05..... Eustace H. Gane.	Chas. E. Caspari.
1905-06..... Chas. E. Caspari.	Daniel Base.
1906-07..... Reid Hunt.	Virgil Coblentz.
1907-08..... Virgil Coblentz.	Chas. E. Vanderkleed.
1908-09..... Chas. E. Vanderkleed.	Martin I. Wilbert.

## SECTION ON PHARMACEUTICAL LEGISLATION.

<i>Chairman.</i>	<i>Secretary.</i>
1887-88..... R. F. Bryant.	W. P. De Forest.
1888-89..... C. W. Day.	J. N. Hurty.



## SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

<i>Chairman.</i>	<i>Secretary.</i>
1889-90..... <i>P. W. Bedford.</i>	A. B. Stevens.
1890-91.....Wm. Simon.	L. C. Hogan.
1891-92.....A. B. Stevens.	" "
1892-93.....R. G. Eccles.	" "
1893-94....." "	" "
1894-95.....Jas. M. Good.	C. S. N. Hallberg.
1895-96.....C. S. N. Hallberg.	Jas. H. Beal.
1896-97....." "	" "
1897-98.....Jas. H. Bea.	H. Gordon Webster.
1898-99.....A. B. Lyons.	C. B. Lowe.
1899-00.....C. B. Lowe.	J. A. Koch.
1900-01....." "	" "
1901-02.....E. G. Eberle.	J. W. T. Knox.
1902-03.....J. W. T. Knox.	Harry B. Mason.
1903-04.....Harry B. Mason.	Wm. L. Cliffe.
1904-05....." "	" "
1905-06.....Oscar Oldberg.	Jos. W. England.
1906-07....." "	" "
1907-08.....Jos. W. England.	Chas. H. LaWall.
1908-09....." "	" "

## SECTION ON PRACTICAL PHARMACY AND DISPENSING.

<i>Chairman.</i>	<i>Secretary.</i>
1900-01.....Henry P. Hynson	F. W. E. Stedem.
1901-02.....F. W. E. Stedem.	Wm. Kaemmerer.
1902-03.....Geo. M. Beringer.	<i>Wm. H. Burke.</i>
1903-04..... <i>Wm. H. Burke.</i>	E. A. Ruddiman.
1904-05.....Chas. A. Kapelye.	Wm. C. Kirchesauer.
1905-06.....Wm. C. Alpers.	H. A. Brown Dunning.
1906-07.....H. A. Brown Dunning.	Joseph Weinstein.
1907-08.....Franklin M. Apple.	" "
1908-09.....Leonard A. Selzer	E. Fullerton Cook.

## SECTION ON HISTORICAL PHARMACY.

<i>Chairman.</i>	<i>Secretary.</i>
1904-05..... <i>Albert E. Eberle.</i>	Caswell A. Mayo.
1905-06.....John F. Hancock.	C. S. N. Hallberg.
1906-07.....Ewen McIntyre.	Eugene G. Eberle.
1907-08.....Edward V. Howell	" "
1908-09.....John B. Bond.	" "



11114

# REPORT

ON THE

# PROGRESS OF PHARMACY.

FROM JULY 1, 1907, TO JUNE 30, 1908.

By C. LEWIS DIEHL.

---

APART from the large number of subjects that have as usual furnished topics for discussion and research throughout the domain of the sciences tributary to the profession of pharmacy, the revision of the Pharmacopœias throughout the world, either in contemplation or as effected, has engaged a more than usual share of attention. In our country, as the time is nearing for the decennial convention (1910) for the revision of the "Pharmacopœia of the United States," much interest is manifested with the view to its betterment as a lawful standard under the "Food and Drugs Act." An interesting paper, pertinent to this subject, was that communicated by A. R. L. Dohme and H. Engelhardt at the New York meeting of the Association, in which the authors advance some reasons why the recent corrections in the definition of some drugs and chemicals, as described in the U. S. P. Revision, were necessary. Two interesting papers also, the one entitled "The Pharmacopœia from the Viewpoint of an Analytical Worker," by W. A. Pearson, the other, "The Pharmacopœia and the Microscopic Examination of Vegetable Drugs," by Henry Kraemer, were read before the Philadelphia Branch A. Ph. A. at the stated meeting in January, 1908.

Mr. Pearson says that our national standard has been well compiled. More praise and little condemnation belong rightfully to the Revision Committee. This publication represents the combined effort of competent men; but, being the result of human effort, it cannot possibly be infallible, nor can it be ideal for the varied needs of the retail druggist, manufacturing chemist, wholesaler and analyst. To the analyst certain require-

ments present themselves in the examination of pharmaceuticals by U. S. P. methods, that allow of some flexibility and might be made more definite by the use of methods which he outlines, together with a few changes and additions that might prove advantageous.

Mr. Kraemer's paper is written in response to an invitation of a committee to discuss: (a) the subject of the microscopic examination of vegetable drugs, (b) the introduction of histological descriptions into the U. S. P., and (c) to consider any of the difficulties which stand in the way of introducing such descriptions into the Pharmacopœia. He treats of this subject under three heads, namely: (1) What has been done in some other pharmacopœias. (2) The Eighth Revision of the U. S. P. (3) What the next Committee of Revision will probably do, and why. In pointing out what has been done by other pharmacopœias, he reviewed the difficulties which beset revision work in this department in our own. He shows that crude drugs are on the whole better in quality and less liable to adulteration than powdered drugs, but as comminuted and powdered drugs are also largely used, the pharmacist must be able to determine them and judge of their quality. This being the case the pharmacopœia should either only give definitions of vegetable drugs, leaving it to be inferred that the pharmacist will acquaint himself with the standard scientific works pertaining to them; or, it should make the descriptions so complete as to apply to the various commercial forms of vegetable drugs.

These papers, which should be read in the original (Amer. Journ. Pharm., Feb. 1908, 81-92), clearly demonstrate the utility of the "Local Branches of the A. Ph. A.," since they make it possible to discuss them in open meetings under most favorable auspices, and give in this way the incentive to further work on kindred subjects by the members in attendance. In point of fact, the monthly meetings held by the different local branches—Baltimore, Chicago, New England (Boston) New York, Northern Ohio (Cleveland), North-Western (St. Paul-Minneapolis), and Philadelphia—have elicited much desirable and valuable information, which without the opportunities given by these organizations, would probably have been lost by the wayside.

Among the topics that have engaged attention at these meetings none have proven more fruitful than

*The Propaganda of the National Formulary.* This has been the chief topic discussed at many of the meetings, and effectual work has been inaugurated by inviting local physicians to be present and to participate in the discussions, such meetings being, in some instances, actually joint meetings of the two professions. Nor have propositions for the betterment of the National Formulary and the correction of its formulas, as also those of the U. S. P., been neglected, and these have contributed a not inconsiderable share to the text of this report. The general character

of these suggestions for betterment, as well as of the topics discussed, are mentioned by their titles under "Proceedings of Local Branches of the State Pharmaceutical Associations." In this connection, also, attention is called to another innovation, namely, the reference, by their titles, under proper classification, to the papers read in the different sections during the previous meeting of the Association; thus embodying all the subjects that have contributed to the Progress of Pharmacy during the period covered by the report. Furthermore, Dr. Paul Runge, having in response to numerous requests communicated, in brevity, the

*Formulas for Dermatological Preparations*, which are prescribed by Dr. Unna in his practice, these, with practical comments concerning the different classes, are reproduced under their proper classification in this report. They comprise: collodions, emulsions, gelatins, injections, mixtures, oils, pastes, pencils, pills, plasters, powders, soaps, spirits, solutions, and ointments; and, inasmuch as many of these preparations are frequently demanded by dermatologists, this complete collection thus becomes available. Dr. Runge says that all of these preparations, which in the text are specified as "Unna," are easily and acceptably prepared by any pharmacists, if the formulas and directions are carefully followed.

At the meeting of the British Pharmaceutical Conference last year (at Manchester), Mr. W. Harrison Martindale contributed a paper entitled "Pharmacy Notes from Various Parts of the World," in which he gives in a condensed form the information gathered from pharmacists and medical men in the various countries of Europe, Asia, Africa, Australia and the Western Hemisphere. By his inquiries in the course of his journeys, the author has come across many points of difference from the prevailing practice at home, and in his notes he endeavored to lay stress on preparations of local produce, and to draw attention to unusual names, modes of administration, strengths and dosage. This paper may be consulted in the "Yearbook of Pharmacy," 1907, 388-398. It may here be mentioned also that Dr. Anna S. Kugler has published in the Amer. Journ. Pharm. (March, 1908, 123-134), a very interesting paper entitled, "A Glance at Ancient and Modern Hindoo Medicine," which deserves more than "a glance."

Turning now to the researches in the domain of chemistry and physics, pure and applied, it may be mentioned that

*Radio-activity of Matter* continues to engage the attention of the most accomplished of the world's investigators. An admirable "Resumé of Recent Researches in Radio-activity," was given in a lecture at the Royal Institution by Professor Ernest Rutherford, an abstract of which will be found under its proper heading in the text of this report. Prof. Rutherford deals briefly with the "disintegration theory of radio-activity," according to which the atoms of radio-active matters are unstable. Every second the atom explodes and expels a portion of its matter at very high

speed. The expelled matter has distinct properties from the mass, and its atoms break up again. The new matter resulting from the disintegration is present in minute quantities only, but the radiations from types of matter afford a method of quantitative and qualitative analysis of great accuracy. The law that governs the breaking-up of the atoms is simple and universal in its application, etc., etc. Attention is then called to the researches on primary radio-active bodies—uranium, radium, actinium and thorium: radium being divided into emanation and seven other varieties, designated by letters, as for example “radium-g,” which is the one named polonium by Mme. Curie. Tracing the parentage of radium, it was thought that uranium might be the parent substance, but this was found to be erroneous. It has been found that a new body, intermediate between uranium and actinium, which has been called *ionium*, is capable of growing radium rapidly. In this connection it is interesting to call attention to the discovery of Sir William Ramsay, that, apparently,

*Lithium is a Decomposition Product of Copper by Radium Emanation.* His experiments, made in conjunction with Mr. Alex. Cameron, point out that although lithium is not the only product obtained when salts of copper are treated with radium emanation, its presence can be explained only by supposing that such a change takes place.

*The Problem of the Solidification of Gaseous Elements* continues to be pursued with unremitting energy, the determination of the freezing-point of the more refractory of these gases being essential for the establishment of an absolute zero of temperature. The successful liquefaction of nitrogen and air, at  $169^{\circ}$ , was followed after many years of experimentation by the liquefaction of hydrogen at  $259^{\circ}$ . When, therefore, early this year (March 5, 1908), it was announced by Sir. James Dewar that Prof. Kamerlingh Onnes (Onnes?), of Leiden, has succeeded in the solidification of the last of the so-called “permanent gases”—helium—the achievement was hailed with congratulations, in the belief that the requisite data for calculating an absolute zero were at last available. Alas! within a month (April 14, 1908), Prof. Dewar was compelled to explain that it was all a mistake; that Prof. Onnes (Onnes?) had found that the helium operated upon, though purified with due care, had by some unexplained accident got mixed with a small percentage of hydrogen, and that the transient solidification witnessed on rapidly expanding the mixed gas from a state of high compression at a very low temperature, was due to the hydrogen, of the presence of which Professor Onnes (Onnes?) was unaware. (See Chem. News, March 13 and April 24, 1908, pp. 121 and 200).

*The Liquefaction of Atmospheric Air* having been successfully accomplished a decade ago, and “liquid air” being now obtainable in unlimited quantities, it is to be expected that experiments should be continued with the object of obtaining it in solid form. Prof. H. Erdmann (Chem. Ztg., 1907, 84) now reports that with the aid of specially constructed apparatus

he has reduced liquid air to a congealed condition. On nearer examination, however, he found that this congelation was due to the crystallization of the nitrogen, and that the congealed mass consisted in reality of crystals of nitrogen in a medium of liquid oxygen. While "solid air" has, therefore, not yet been formed, the results obtained are doubtless of great importance, inasmuch as it permits the separation of nitrogen and oxygen from each other with a rapidity and completeness not heretofore attainable, by the fractionation of liquefied air. Moreover, the process appears well adapted for the production of

*Pure Nitrogen* from the commercial product usually supplied in steel flasks. By the aid of the special apparatus mentioned, magnificent large crystals are obtained, which are easily freed from the mother liquid and yield on melting, &c., chemically pure nitrogen.

*The Artificial Production of Nitrates from Atmospheric Air* also deserves brief mention here. Speaking of the successful fixation of nitrogen and the establishment of extensive nitrate-manufacturing plants in Europe, Mr. W. A. Pearson (Amer. Drugg., Feb. 24, 1908, 89) says that although American investigators were among the first to attempt the commercial production of the artificial nitrates, the success of the process of manufacture was not made manifest until the results of the practical work of George M. Heath became known. By means of a high-pressure furnace, in which a powerful electrical flame sweeps through the air, he makes it possible to combine oxygen and nitrogen in large quantities, and at a relatively low cost. The electrical furnace is the moving power of the whole process. Into such a furnace atmospheric air is driven under high pressure, where it is speedily heated to 3500° C. The air passing through the furnace emerges laden with oxides of nitrogen, and by simply leading these gases through water in sprinkling towers they are converted into nitric and nitrous acids. The latter acid evaporates rapidly and recombines with water, the result being that ultimately all the fumes are transformed into nitric acid. When these gases are brought into contact with caustic soda, nitrate of soda is formed, and if brought into contact with caustic potash, saltpetre is the result.

Considerable activity has also been manifested during the year in the study of the "rare earths." A new element,

*Lutecium*, has been split from Marignac's ytterbium by G. Urbain, who, in conjunction with G. Jantsch, has begun a study of the elements of the yttrium group of rare earths, and has reported so far the results of their study of terbium and dysprosium compounds. Several papers on the "Separation of the Yttrium Earths" have also been communicated, those of Mr. C. James, depending on the fractional crystallization of their bromates, deserving particular attention. It is interesting to note also that the elementary identity of

*Neo-Erbium*, which has recently been questioned by Kruss and Nilson,

has now been confirmed by the experiments of K. A. Hoffmann and O. Burger.

It is not my purpose to encumber this introductory with extensive details on any particular subject, but among the many interesting subjects that have been brought to the attention of the medical profession, that of

*The Opsonic Theory and the Future of Bacterial Vaccines*, may properly be reviewed at some length. Quoting freely and indiscriminately from a number of papers that have been published during the year (by L. H. Warner, \* E. M. Houghton, † Elsie Wardle, ‡ and others), the following may serve to elucidate a subject which appears destined to play an important role in the future practice of therapeutics, and demands the attention of the progressive pharmacist only in a less degree than it does that of the practitioner of medicine.

We are indebted to Metchnikoff for calling attention to and explaining the role of the white blood cells in the defense of the body against bacterial invasion, a phenomenon to which he applied the term

*Phagocytosis*. This represents the swallowing or incorporating of foreign substances by certain cells, known as "phagocytes," which in turn are divided into fixed phagocytes, comprising the fixed connective-tissue cells and endothelium, and the free phagocytes. The term phagocyte must however not be regarded as synonymous with "leucocyte," as some species of the latter are immobile and never attack or take up bacteria. Phagocytes possess amoeboid movement so as to be able to migrate, to apprehend, to digest, and assimilate bacteria or other foreign bodies. As far as known these cells possess no volition or nervous apparatus giving them tactile sense, still they approach substances fitted for their use and engulf them. The result of his comprehensive studies led Metchnikoff to advocate the use of the term "Stimulins" in preference to "Antitoxins," basing this on the claim that the antitoxic action of serums does not exist, that the serums do not act directly on toxins, "but cause to bring into play certain forces of the organism (namely, the phagocytes), whose absolute integrity is necessary for the manifestation of the influence of the serum."

These latter observations led up to the bacterial vaccine theory, advocated and put into practical use by Sir A. E. Wright, M. D., a guide to which is known as the "Opsonic Index." At the time of Metchnikoff's publication of the theory of phagocytosis, Wright was busily engaged in biological research, and it was but natural that he directed his work to

---

\* "The Opsonic Theory and the Future of Bacterial Vaccines," by H. L. Warner, Ph. G., M. D., in *Amer. Drugg.* Dec. 23, 1907, 389-390.

† "A Review of the Opsonins and Bacterial Vaccines" by E. M. Houghton, in *West. Drugg.* Aug., 1907, 456-459.

‡ "The Opsonic Treatment and Test," by Elsie Wardle, in *Pharm. Journ.*, Feb. 29, 1908, 260-262.



discover the nature of the composition of the cell-body of the phagocytes. He observed that bacteria were not molested by washed leucocytes, but that the same bacteria previously mixed with human or animal blood would be eagerly devoured by the phagocytes. Washing the bacteria after bringing them in contact with blood revealed further that they were eagerly taken up by the washed leucocytes. He next directed his efforts to determine what substance of the blood should cause this special attractive property in the leucocytes. Deductions from his studies led him to believe that it was some kind of substance given off by the cells of the body, and this substance, unknown as to its complex organic composition, but possessing the property of fixing or engulfing in a manner so as to excite and increase the phagocytic properties of the leucocytes, Wright named

*Opsonin*—this name being derived from the Greek verb “*opsoneo*”—meaning “I prepare or make ready for the banquet.” As to the nature of opsonins very little is known, though in some respects there is reason to believe that they resemble ferments. They are thermolabile,—that is, destroyed by heating the serum for fifteen minutes to a temperature of 60° C. They also show a sensitiveness to slight increase in the acidity or alkalinity of the medium in which they exist, acting best in a neutral medium, and thus bear an analogy to the ferments. It is, however, known that they are colloidal in nature, and not capable of dialysis, and when serum is half saturated with ammonium sulphate, and euglobulin added, the opsonins are carried down. Thus it is not unlikely that they are related to the proteids, but until they can be isolated and obtained in a state of purity their true composition cannot be stated.

Blood serum contains a large number of opsonins, each specific for a given organism, so that serum may be deprived of its power of acting on one kind of bacillus, while it retains its power over another kind. If a specimen of blood be collected in a small glass capsule, and allowed to stand for a few minutes, only two layers are apparent to the naked eye—the upper one a pale straw-colored liquid, the serum, or plasma, as it is called, and a lower which is dark red in color. This lower layer is made up of disc-like red corpuscles, white blood corpuscles, and a very thin layer of blood platelets. The white corpuscles, or “leucocytes,” are tiny masses of protoplasm which are capable of movement from place to place. These leucocytes may be looked upon as scavengers. “Wherever in the blood there is an invasion of certain kinds of bacteria thither flock the white corpuscles to do battle with and devour the enemy.” If they can absorb microbes faster than they multiply, then the body is saved from disease; but they will not touch the invading microbes unless they are rendered tasty and attractive by something in the blood liquid. Here then the function of the opsonins presents itself; the white corpuscles (leucocytes) will eat up one kind of bacilli just in proportion to the amount in which a particular opsonin is present. This amount is ascertained by

The "*Opsonic Index*" already referred to, which is determined by ascertaining the number of bacteria engulfed or devoured by the leucocytes of the sick person as compared with the number devoured by those of a healthy subject. Thus, in a case where the opsonic index of an individual towards a particular disease is given as 0.6, it means that where the normal individual's blood could dispose of 100 microbes, that of the subject could only devour 60. The remedy, consisting of the deadened microbes that have caused the disease, is then applied by injection on the basis of the figures so ascertained: the theory of the effect of the inoculation being that the opsonin in the blood unites with the dead innocuous microbes which are injected, and stimulates the body to produce not only more, but an excess of opsonin. These opsonins are protective substances, and according to the proportion in which they are present, the disease will flourish or will be overcome.

## PROCEEDINGS OF THE LOCAL BRANCHES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(SEASON 1907-1908)

Although the reports of the transactions of the Local Branches of the Association, in the "Bulletin," faithfully portray the nature of the work that engages the attention of the pharmacists of our country, the information thus supplied lacks in one important respect—namely, that it cannot give in comprehensive review the entire field of effort and accomplishment by the individual Branches. The information being scattered through many numbers of the "Bulletin," issued at monthly intervals, is necessarily unconnected, and we may therefore fail to realize or recognize the consistency of efforts which so largely depend upon local conditions. It was conceived that a brief "résumé" of the work done in the individual Branches from month to month, or from meeting to meeting, might prove a convenient and welcome addition to this report, and serve as a convincing proof of the admirable work that is being done by these local organizations in advancing pharmaceutical progress without losing sight of the responsibility that links the profession of pharmacy to that of medicine. The attempt at such a "résumé" has been made in the following, with the hope that it may accomplish the desired purpose.

### BALTIMORE BRANCH.

*October, 1907.*—The opening meeting for the season of 1907-1908 was held on the 24th day of the month. A number of reports were received and discussed, and a committee of five was elected to make a thorough study of propaganda work to be done and to present a plan for action at the next meeting.

*November, 1907.*—The meeting of the month was a joint meeting of

physicians and pharmacists, which was held at the Medical and Chirurgical Faculty Hall, and the foundation was laid for an active and yet not radical campaign by both professions, to further increase during this season, the use of official preparations. Papers were read and discussed on the following subjects :

"What the Doctor Should Do," by Dr. Llewellys F. Barker and by Dr. John Rurah.

"What the Druggist Should Do," by Martin I. Wilbert and by H. A. B. Dunning.

*January, 1908.*—The stated meeting held on the 16th day of the month, being the annual meeting, the officers for the ensuing year were elected : Chas. Caspari, Jr., President ; E. F. Kelly, Secretary-Treasurer. The reports of the officers and standing Committees for the preceding year demonstrated that very effective work was being done. The principal topics of discussion at this meeting were those having a bearing on the State Food and Drugs Law in contemplation of enactment by the General Assembly of Maryland. After the suggestions of a Committee had been considered *seriatim*, the Branch went on record as favoring the passage of a Pure Food and Drugs Law, and as approving the proposed bill with certain modifications recommended by the Committee.

*February, 1908.*—The stated meeting of this month was devoted almost entirely to the presentation and discussion of papers on matters of practical interest to the retail druggist.

Among the topics presented and discussed were the following :

"Labor Saving Devices," by C. L. Meyer.

"Finishing Touches," (tasty packaging, labeling, etc.), by H. P. Hynson.

An invitation from the Section on Clinical Medicine and Surgery of the Baltimore City Medical Society to hold a joint meeting on March 20th, was accepted, this to take the place of the regular March meeting.

Dr. Chas. Caspari, Jr., having resigned the presidency of the Branch, Mr. Samuel Mansfield was elected President at this meeting.

*March, 1908.*—Pursuant to resolution at the February meeting the members of the Branch met on the 20th day of the month in joint session with the members of the Section on Clinical Medicine and Surgery of the Baltimore City Medical Society. The principal topic for discussion was the growing evil of "Profit Sharing in Nostrum Companies" on the part of physicians and pharmacists, as suggested by Dr. Chatard at the February meeting of the Branch. A topic, germane to the subject, was introduced as "Hidden Prescription Difficulties," by H. P. Hynson. Both topics were freely and interestingly discussed by the members of both professions.

*May, 1908.*—Reciprocally, the members of the Baltimore City Medical Society were the guests of the Branch at the regular meeting held on the 21st day of the month, the program outlined for this event being as follows :

"Standardization by Physiological Means," by Dr. Albert C. Crawford, Pharmacologist, Bureau Plant Industry, Washington, D. C.

"Standardization by Assay," by Dr. Chas. Caspari, Jr.

"Cocaine and its Substitutes," by Dr. Herman Engelhardt.

The first two topics were presented and discussed, and elicited much interest. The paper of Dr. Engelhardt unfortunately could not be read, owing to the illness of its author, but will probably be presented at a future meeting of the Branch.

The next meeting will be held in October.

#### CHICAGO BRANCH

*October, 1907.*—The first meeting of the season 1907–1908 was held on the 15th day of the month at the Northwestern University Building. The Committee on Practice made an interesting report, in which a list of U. S. P. and N. F. formulas was presented for discussion. It was suggested during the discussion that followed that members should select one or more formulas as they are reported from time to time, and in turn report the results of their experiments made upon them.

*November, 1907.*—The second meeting of the season was held on the 19th day of the month. The question of an exhibit of U. S. P. and N. F. preparations at the annual meeting of the A. M. A. in Chicago (June 1908), was discussed. The Committee on Practice presented a report in which improvements in the following of the newer preparations were discussed: *Liquor cresolis compositus*, U. S. P.; *elixir ferri, quininæ et strychninæ phosphatum*, U. S. P.; *liquor ferri peptonati cum mangano*, N. F., *elixir gentianæ glycerinatum*, N. F.; *liquor sodii phosphatis compositus*, U. S. P.; *syrupus hydrochlorophosphatum*, N. F.

*December, 1907.*—The stated meeting, held on the 17th day of the month, proved unusually interesting, a number of important suggestions for improvements in formulas for U. S. P. and N. F. preparations being made, among them the following:

"Solution of Peptonate of Iron and Manganese, N. F." (a preliminary report), by Prof. Wm. H. Harrison.

"Compound Solution of Cresol, U. S. P.," by Ferdinand Nitardy.

"Compound Resorcin Ointment, N. F.," by Henry Pfaff.

*January, 1908.*—The stated meeting was held on the 21st day of the month. Being also the (second) annual meeting, the time of the Branch was taken up mainly by the transaction of business incident to winding up the affairs for the past year and the election of officers. Professor Oscar Oldberg, against his protest, was re-elected President; W. B. Day, Secretary-Treasurer. A report on "Compound Solution of Cresol" was deferred for consideration at the next meeting. The difficulties of making and keeping syrup of hypophosphites, and of getting drugs and chemicals of sufficiently high grade, were briefly discussed.

*February, 1908.*—The regular meeting was held on the 18th day of the month. The Committee on Practice reported a number of formulas for U. S. P. and N. F. preparations which had been experimented with by E. E. Cassin, F. Nitardy, J. Bohm, and others, comprising: Fluidextract of licorice, elixir of iron, quinine and strychnine phosphates, syrup of wild cherry, glycerinated elixir of gentian, compound solution of cresol, magma of magnesia, etc. These several subjects gave rise to an interesting discussion, in the course of which the opinion was expressed with apparent unanimity that the use of "saccharin" as a sweetening agent in medicinal preparations should be avoided wherever possible.

*March, 1908.*—The meeting held on the 17th day of this month was devoted chiefly to the consideration of proposed pharmaceutical legislation. A series of recommendations was unanimously adopted for the consideration of the Legislative Committee of the State Pharmaceutical Association. A series of resolutions on certain practices of manufacturers, embodying protests against specified encroachments and abuses affecting the practice of the retail pharmacist, was also adopted.

*April, 1908.*—The regular meeting, having been postponed by order of the Executive Committee, was not held until the 28th day of the month. A preliminary report of a Committee on Exhibit at the A. M. A. meeting, June 2-6, was received, discussed and approved. Working formulas were reported for a number of preparations, as follows:

"Magma Magnesiae," by John J. Boehm.

"Proteid Iron Solutions" (liquor ferri peptonati; liquor ferri peptonati cum mangano; liquor ferri albuminati), by William H. Harrison.

"Liquor ferri peptonati cum mangano" (Improved Formula), by H. Schaper.

"Elixir ferri, quininæ et strychninæ phosphatum, improved," by H. Schaper.

The Committee on Medical Relations reported a number of joint meetings having been held recently largely attended by physicians and also by pharmacists in their respective localities. Also, that the "Declaration on the Prescription" (see April meeting of N. Y. Branch) had now been adopted by nearly one-half of the Branch societies of the city.

*May, 1908.*—The regular meeting was held on the 19th day of the month. The Committee on Practice presented several N. F. preparations for topics of discussion, including: Solution of peptonate of iron with manganese, syrup of citro-chloride of iron, syrup of calcium iodide, magma of magnesia. The question of "Color Standards" was also discussed. The question of the proposed reorganization of the A. Ph. A. was also brought up, but its consideration was deferred until the next regular meeting.

*June, 1908.*—The regular meeting was held on the 16th day of the month. I. H. Wells reported that the recommendations of the Branch to

the Legislative Committee of the Illinois Pharmaceutical Association (see March meeting), which had been concurred in by the C. R. D. A., had been adopted at the Peoria meeting of the State Association. The subject of the reorganization of the A. Ph. A. was discussed, but no action was taken. The only preparation discussed was "Solution of Bromide of Gold and Arsenic, N. F.," which, it is claimed, requires revision. The president announced that there would be no regular meeting of the Branch until after the annual meeting of the Association.

#### NEW ENGLAND BRANCH.

*October, 1907.*—The fourth regular meeting was held at the Massachusetts College of Pharmacy on the 3d day of the month, the principal topic of discussion being the program for the coming winter: It was decided that at the next regular meeting each member should invite one or more physicians, who would be entertained by a dinner to be followed by speaking on various preparations of the U. S. P. and N. F.

*December, 1907.*—The annual meeting was held on the 5th day of the month at the Hotel Vendome. A number of physicians were present. Dr. Buck spoke at some length upon "The Necessity of Doctors Consulting their Druggists Upon Questions Concerning Materia Medica and Pharmacy," and the following papers were read and discussed:

"The Relationship Between Physicians and Pharmacists," by James F. Finneran.

"The Digestive Power of Pepsin Preparations," by Professor C. F. Nixon.

"The Official Antiseptics," by Professor E. H. La Pierre. At the business session C. Herbert Packard was re-elected President; R. Albro Newton, Secretary-Treasurer.

*February, 1908.*—The regular meeting was held at Hotel Plaza, Boston, on the 12th day of the month, with a number of guests who were entertained at supper. The only business of importance that appears to have been transacted at this meeting was a vote that "this Branch favors the strict adherence to the Pharmacopœia by manufacturers and jobbers on official preparations."

*May, 1908.*—The meeting of the Branch was held on the 23d day of the month, taking the form of a reception tendered by the various pharmaceutical organizations of Boston at the Hotel Vendome to the Board of Trustees of the United States Pharmacopœia Convention. Post-prandial speeches by the guests and Presidents of the Pharmaceutical Associations held the attention of those present until nearly midnight.

#### NEW YORK BRANCH

*October, 1907.*—The fourth regular meeting, inaugurating the season 1907-1908, was held in the library of the New York College of Pharmacy,

on the 14th day of the month. The most important outcome of this meeting was a resolution, which was adopted, that the president of the Branch should appoint a committee of three on the U. S. P. and N. F. Propaganda with instructions to confer with similar committees from other local organizations of pharmacists with a view of bringing about concerted action between the various organizations in this particular field of work.

*November, 1907.*—The fifth regular meeting was held on the 10th day of the month. The report of the Committee on U. S. P. and N. F. Propaganda was deferred, in favor of an address by Dr. Muir, in which he described the work of the Kings County Pharmaceutical Association, which is carried out, with every promise of success, to acquaint physicians with the preparations of the two standards.

*December, 1907.*—The sixth regular meeting was held on the 9th day of the month. The principal topic, which was thoroughly discussed by the members in attendance, was the method or methods best calculated to make a successful propaganda of National Formulary preparations, during which it developed that neatness in the appearance of package and uniformity in the color of identical preparations, submitted to the inspection of physicians, was considered an important desideratum. On motion, a committee was appointed to arrange for a joint meeting of pharmacists and physicians.

*January, 1908.*—The second regular meeting was held on the 13th day of the month. A report of the Committee on the Proposed Reorganization of the A. Ph. A. was received and adopted. Prof. H. J. Lohmann read a brief note on "Tincture of Iodine, U. S. P.," which formed the basis for an animated discussion, and from which it developed that the formula of the U. S. P. VIII is reliable, that the tincture does not deteriorate as rapidly as is maintained by some observers, and that, in as far as the experience of the New York Board of Pharmacy is concerned, at least 92 per cent. of the tinctures examined came up to the pharmacopœial standard. An interesting address was delivered by Dr. L. L. Leaman, late Major U. S. V., and author of "The Real Triumph of Japan," in the course of which he referred to the organization of the Japanese Pharmaceutical Corps, briefly sketched the duties performed by the pharmacist in the Japanese army, and pointed out the great economy effected by the method of organization. This was followed by a discussion of the National Formulary as a legal standard, and some of the serious faults leading up to the question of eliminating all reference to the National Formulary in the proposed State Drug Law. Upon this subject, however, considerable difference of opinion, both on the positive and negative side of the question, was developed. At the business session, following these discussions, Professor Herman J. Lohmann, of Jersey City, was elected President; Hugh Craig, of New York, Secretary-Treasurer.

*February, 1908.*—At the eighth stated meeting, held on the 10th day of

the month, the principal topic of discussion was introduced by a paper of Dr. George C. Diekman on the "Ointments and Cerates of the Pharmacopœia," in which attention is called, commendably and adversely, to all the formulas of that standard with few exceptions. In the experience of a number of members, who participated in the discussion, the objections to some of the formulas, pointed out by Dr. Diekman, were well taken. In view of the inability of a committee appointed for the purpose, to perfect arrangements for the joint meeting with physicians (see October meeting), the Committee on Professional Relations was instructed to co-operate with the Propaganda Committee with full power to make all necessary arrangements for a joint meeting—with the county medical society if possible—to be held, not later than March or April, at such time and place as the committee saw fit.

*March, 1908.*—The ninth stated meeting was held on the 9th day of the month. A report from the committee on Education was received and ordered entered on the minutes. The Committee on Professional Relations reported in effect that they were unable to receive any response to communications addressed to the secretary and, subsequently, to the president of the Medical Society of the County of New York, on the subject of a joint meeting of the two local Associations. Favorable results on the propaganda work were reported by several members. A very interesting paper on the

"Difficulties in Dispensing," was presented by J. Leon Lascoff.

"A Simple Contrivance for Facilitating the Dispensing of Capsules Containing Liquids" was exhibited and explained by Thos. D. McElhenie.

*April, 1908.*—The tenth stated meeting was held on the 13th day of the month. The Committee on Professional Relations submitted the draft of a "Declaration of the Status of the Prescription," which, after discussion, was unanimously adopted in a suitable form, the secretary was authorized and directed to have copies prepared and to distribute the same among the medical and pharmaceutical societies and journals of the Metropolitan district. The special Propaganda Committee reported favorable progress in the efforts made for a joint meeting, believing now that it will become possible to hold such a meeting some time in May. An interesting and instructive paper on

"The Liniments of the U. S. P." was read by Otto Raubenheimer, and was received with many expressions of approval.

*May, 1908.*—The eleventh stated meeting was held on the 11th day of the month. The Committee on Professional Relations reported that copies of the "Declaration on the Status of the Prescription" had been sent out to about seventy medical and pharmaceutical organizations, and that it was receiving general approval. The Propaganda Committee reports that a hall in the Academy of Medicine had been secured for the proposed joint meeting with physicians, and that the pharmaceutical program of subjects and speakers at this joint meeting had been arranged as follows :



"The Relation of the A. Ph. A. to the Pharmacist as Compared with the A. M. A. and the Physician" (H. J. Lohmann).

"The United States Pharmacopœia" (W. C. Anderson).

"The National Formulary" (W. C. Alpers).

"The Training of the Pharmacist" (G. C. Diekman).

"Exhibit and Explanation of a Number of Official Preparations" (Jacob Diner).

"A discussion on "Ambiguous Abbreviations in Prescriptions" elicited a spirited discussion at this meeting, which was supplemented by some interesting observations concerning "Emulsions."

The unpreparedness of many pharmacists to supply National Formulary preparations, and the causes thereof also constituted interesting topics of discussion at this meeting.

#### NORTHERN OHIO BRANCH

*November, 1907.*—The season of 1907-1908 was inaugurated by a meeting held at the Cleveland School of Pharmacy on the 20th day of the month. The principal subject of discussion was the U. S. P. and N. F. Propaganda, and some interesting suggestions were made, concerning both this work for the future, and the direction in which certain formulas in the N. F. require modification or correction. Dr. Sollmann, a member of the Council on Pharmacy and Chemistry of the A. M. A., declared that physicians were ready to prescribe U. S. P. and N. F. preparations and agreed with others that the propaganda of the local association must be continued at all hazards.

*December, 1907.*—The stated meeting, held on the 20th day of the month, was devoted to the consideration of defects in a number of U. S. P. and N. F. preparations and the direction in which they should or might be improved. The discussion hinged mainly on a report made by Wm. T. Hankey on tincture of cudbear, which, in turn, brought up the question of a standard of color for N. F. preparations tinted with cudbear and other dyes. The preparations that came up for discussion were: Compound resorcin ointment, glycerinated elixir of gentian, solution of sodium phosphate, and cataplasm of kaolin.

*April, 1908.*—The stated meeting, held at the Colonial Hotel, Cleveland, on the 3d day of the month, was in reality a joint meeting of the Northern Ohio Branch A. Ph. A. and of the Northern Ohio Druggists' Association. The topics discussed were the financial possibilities of the U. S. P. and N. F. Propaganda and the aids to this Propaganda which the N. A. R. D. stood ready to furnish the retail pharmacist. It was suggested that future meetings be so arranged that one month the N. O. D. A. hold a meeting, while in the alternate month a joint meeting of the N. O. D. A. and of the A. Ph. A. Branch be held.

## NORTHWESTERN BRANCH.

*November, 1907.*—The first meeting of the season 1907-1908 was held on the 20th day of the month, at the Hotel Nicollet, Minneapolis, with the co-operation of the Minneapolis Retail Druggists Association and the St. Paul Retail Druggists Association. The U. S. P. and N. F. Propaganda was the principal topic of discussion. The chair was instructed to appoint a committee of nine to consist of three pharmacists from each of the twin cities, the secretaries of the Hennepin County Medical Association and the Ramsey County Medical Association and the chairman (Prof. Wulling) with full power to arrange for meetings in January in each of the Twin Cities, to which physicians should be invited as guests of the pharmacists.

*January, 1908.*—The stated meeting was held at the Hotel Nicollet, Minneapolis, on the 22nd day of the month, with an attendance of 107, about one-half being physicians. The President, Dean Wulling, introduced the principal topic for discussion: "The United States Pharmacopœia and the National Formulary," in a lengthy address, which was well received by all present, especially by the physicians, and gave the incentive to an animated discussion. About twenty-five samples of U. S. P. and N. F. preparations, made by Twin City pharmacists, were exhibited.

*February, 1908.*—The stated meeting was held at the Merchants' Hotel, St. Paul, on the 19th day of the month, with an attendance of 78, the majority being physicians who had been invited by the individual pharmacists. The topic for discussion was introduced by President Wulling, and was, as at the stated meeting in January, "The U. S. Pharmacopœia and the National Formulary," which was freely discussed in its various bearings both by the invited physicians and their hosts. The President was instructed to consult with the officers of the Ramsey County Medical Association with the object of bringing about a joint meeting with the Northwestern Branch at a convenient time.

*May, 1908.*—Pursuant to the resolution at the February meeting, a joint meeting of physicians and pharmacists was held at the Saulpaugh House, Mankato, Minn., on the 6th day of the month. President Wulling introduced the principal topic for discussion, "Ethical Pharmacy and Medicine," in an address which was well received by the members of both professions, and was freely discussed. The meeting was voted a success.

Another joint meeting of physicians and pharmacists was held in conjunction with the Minneapolis Retail Druggists' Association at the West Hotel (Minneapolis?) on May 28th. President Wulling laid the foundation for the discussion in an address in which he pointed out that the interests of both professions met closely along the lines of *Materia Medica*, prescribing and dispensing, and that both professions should grow more equally along the lines on which their interests touch. The discussions were quite animated and particularly felicitous on the part of the

physicians, who manifested a sincere interest in the movement inaugurated by the pharmaceutical profession in order to arrive at a more satisfactory understanding of the mutual interests of the two professions.

#### PHILADELPHIA BRANCH.

*October, 1907.*—The first stated meeting for the season 1907-1908 was held on the 1st day of the month, at the College of Physicians. The program for the evening was a discussion of the U. S. P. and N. F. Propaganda. The following papers were read :

"The Need of Personal Work," by Ambrose Hunsberger.

"Possibilities of Association Work," by Franklin M. Apple.

"Some of the Obstacles to be Overcome," by John K. Thum.

*November, 1907.*—The stated meeting of this month was devoted to a discussion of the official standards and tests, and the following papers were read and discussed :

"Comments on Some Official Standards and Tests," by L. H. Bernegau.

"Official Standards and Tests from the Standpoint of the Retail Druggist," by Wm. L. Cliffe.

"The U. S. P. Eighth Revision and Its Relation to Some Drugs and Chemicals," by A. R. L. Dohme and Herman Engelhardt.

*December, 1907.*—The stated meeting on the 3d day of the month, was devoted to a discussion of nostrums and newspaper advertisements, and was attended by quite a number of physicians.

"The Evil Influence of Mystery, in Therapeutic Agents," was the theme presented for discussion by Dr. John H. Musser.

"The Physician's Breach of Trust—the Use of Secret Medicines," was the subject presented by Dr. John B. Roberts.

"The Accurate Knowledge of the Composition of Medicines Prescribed by Physicians is Demanded," was the title of a paper presented by Dr. Henry W. Cattell.

These several topics were thoroughly ventilated and discussed by a number of physicians and the members of the Branch present at the meeting.

*January, 1908.*—The stated meeting, held on the 7th day of the month in the hall of the College of Physicians, was devoted to the subject of the "Valuation of Drugs and Assay Processes." The following papers were read and discussed :

"Recent Progress in the Chemistry of Alkaloid Estimation," by W. A. Puckner.

"The Pharmacopœia from the View-Point of a Scientific Worker," by W. A. Pearson.

"The Standardization of the Preparations of Digitalis by Physiological and Chemical Means," by Dr. E. D. Reed and Chas. E. Vanderkleed.

"The Use of the Compound Microscope in the Valuation of Drugs," by Henry Kraemer.

*February, 1908.*—The stated meeting, held on the 4th day of the month, was devoted to the discussion of "The Responsibilities of the Retail Druggists in the Spread of the Great Black Plague," the subject was introduced by Dr. Henry Beates, Jr., who discussed

"The Relation of Medical Practice Acts to Contagious and Infectious Diseases." An exhaustive paper on

"Gonorrhea, Its nature, Prevalency, Recognition and Treatment," was read by Dr. A. A. Uhle.

"The Infection of the Innocent and the Suffering and Misery that is Entailed," was elucidated by Dr. E. E. Montgomery.

"The More Remote Complications of Gonorrhea in the Male," was discussed by Dr. Thos. Neilson; and

"Gonorrheal Ophthalmia and Its Relation to Total and Partial Blindness," was the topic introduced by Dr. Geo. E. de-Schweinitz.

*March, 1908.*—The stated meeting, held on the 3d day of the month, was devoted to a discussion of the several problems that are involved in "The Manufacture and Sale of Flavoring Extracts," which was participated in by members of the American Extract Manufacturers' Association, from Philadelphia, New York, Brooklyn, Jersey City, Baltimore and other places. The following papers were read and discussed:

"Formulas for Flavoring Extracts," being the views from a practical standpoint of the American Extract Manufacturers' Association, by A. E. Claus.

"The U. S. P. as a Standard for Flavoring Extracts," by I. V. S. Stanislaus.

"Some Flavoring Extracts I Have Seen," by Chas. H. LaWall.

At a business session, preceding the regular meeting, Wm. McIntyre was re-elected President; M. I. Wilbert, Secretary-Treasurer.

*April, 1908.*—The stated meeting, held on the 7th day of the month, was devoted to a discussion on "Adulterations and Their Detection." The following papers were read and discussed:

"The Adulteration of Volatile Oils," by Dr. Geo. R. Pancoast and W. A. Pearson.

"Some Remarks on the Adulterations of Drugs and Chemicals as Found in Practice," by L. Henry Bernegau.

"The Drug Laboratory of the Bureau of Chemistry as a Factor in the Detection of Adulterations," by Lyman F. Kebler.

*May, 1908.*—The stated meeting for the month was devoted to a discussion of "Pharmaceutical Associations and their Uses." The following papers furnished topics for discussion:

"The Status of Pharmacy and of Pharmacists in Europe," by M. I. Wilbert.

"The N. A. R. D. as a Factor in the Progress of Pharmacy," by Thos. H. Potts.

"The Reorganization of the American Pharmaceutical Association," by Henry Kraemer.

---

## PROCEEDINGS OF THE STATE PHARMACEUTICAL ASSOCIATIONS.

The information concerning the meetings of the State Pharmaceutical Associations held during the year 1907 has been obtained partly from the printed proceedings of the several Associations (22 in all) and partly from the reports available in the pharmaceutical journals, the source of information being indicated at the conclusion of each abstract. It is noteworthy that with the exception of Nevada and Wyoming, in which States no State Associations appear as yet to have been organized, all the States, including for the first time California and Idaho, are represented in this report and are now in line.

*Alabama.*—The Twenty-sixth Annual Meeting of the Alabama Pharmaceutical Association was held at Blount Springs, June 12 and 13, 1907, in five sessions. E. W. Averyt, of Ensley, was elected President; W. E. Bingham, of Tuscaloosa, Secretary. The following papers were read:

"Commercial Interest of the Drug Traffic," by ——— Thomason.

"Sociability and Fraternalism in Our Association," by L. Wharton.

The Association adjourned to meet at Blount Springs, June 10, 1908.

—(*From Proceedings, 1907.*)

*Arkansas.*—The Twenty-fifth (Silver-Jubilee) Annual meeting of the Arkansas Pharmaceutical Association was held at Hot Springs, May, 1907, in ——— session. Frank G. Schachleiter, of Hot Springs, was elected President; Miss Mary A. Fein, of Little Rock, Secretary-Treasurer. The Association adjourned to meet at ——— in 1908.

—(*From Merck's Rep., July, 1907.*)

*California.*—With the Thirty-eighth Annual Meeting of the California Pharmaceutical Society, held in San Francisco, November 14, 1907, that Society ceased to exist. But, phoenix-like, it rose from the ashes and was immediately reorganized under the name and charter of the

*California Pharmaceutical Association*, which, assuming all responsibilities and liabilities of the original organization, elected the officers and a board of trustees to serve until the next annual meeting. California has thus, after many years, come into line with the other State Associations. W. M. Searby, of San Francisco, was elected President; L. W. Nish, of ———, Secretary. It was voted that "The Pacific Pharmacist" be made the official organ of the Association. The following papers were read and will appear in full in this journal in due course:

"Glycerin, Rose Water and Benzoin," by Val. Schmidt.

"Drug Store Help," by J. A. Sanford.

"Pharmacist *vs.* Physician," by Fred. J. Lackenbach.

"Bones of Contention I Have Recently Met With," by S. A. McDonnell.

"California Pharmacy Legislation," by A. L. Leber.

"What Tools Do You Work With," by W. M. Searby.

"Marking of Some Goods—Cost and Selling Price," by S. A. McDonnell.

"Phenol and Suicide," by H. B. Carey.

"Legislation and Co-operative Buying," by W. B. Cheatham.

"Tuberculin," by Miss C. A. Roehr.

"Hints to Dispensers of Prescriptions," by Val. Schmidt.

"Pharmaceutical Law," by C. B. Whilden.

"Collection and Marketing of Vegetable Drugs on the Pacific Coast," by F. A. Week.

"Coloring Matter of Flowers," by W. T. Wenzell.

"Esthetic Medicinal Plants," by R. G. Eccles.

The last two papers and the paper by W. B. Cheatham, were read by title.

The Association adjourned to meet in May, 1908, the place of meeting to be selected by the Board of Trustees.

—(*From the Pacific Pharmacist, Nov., 1907.*)

*Colorado.*—The Eighteenth Annual Meeting of the Colorado Pharmaceutical Association was held at Glenwood Springs, June 12-14, 1907, in — sessions. C. M. Ford, of Denver, was elected President; A. G. Clark, of Denver, Secretary.

The Association adjourned to meet at Glenwood Springs in 1908.

—(*From Drugg. Circ., July, 1907.*)

*Connecticut.*—The Thirty-first Annual Meeting of the Connecticut Pharmaceutical Association was held at Bridgeport, June 12, 1907, in three sessions. Joseph D. Hartigan, of Bridgeport, was elected President; John B. Ebbs, of Waterbury, Secretary. The following papers were read:

"The Aspiring Drug Clerk and His Preceptor," by A. L. Dickinson.

"Pharmacy Laws" (A Critical Review), by Robert Walker.

The Association adjourned to meet at Magnolia (Mass.), June 19-21, (evidently to hold a joint meeting with the Allied Pharmaceutical Associations of New England). (*From Proceedings, 1907.*)

*Delaware.*—The Twenty-first Annual Meeting of the Delaware Pharmaceutical Association was held at Dover, May 2, 1907. R. M. Kauffman, of Seaford, was elected President; F. W. Fenn, of Wilmington, Secretary.

The Association adjourned to meet at — in 1908.

—(*From Meyer Bros. Drugg., July, 1907.*)

*Florida.*—The Fourth Annual Meeting, since its re-organization of the

Florida Pharmaceutical Association was held at Atlantic Beach, June 12-14, 1907, in ——— sessions. D. W. Ramsaur, of Palatka, was elected President, and J. H. Houghton, of Palatka, Secretary.

The Association adjourned to meet in Tampa in 1908.

—(*From Drugg. Circ., July, 1907.*)

*Georgia.*—The Thirty-second Annual Meeting of the Georgia Pharmaceutical Association was held at Savannah, May 21-22, 1907, in two sessions. J. D. Persse, of Savannah, was elected President; Max Morris, of Macon, Secretary. The following paper was read:

"How May the Drug Clerk Situation be Improved?" by Dr. McCarthy. The Association adjourned to meet at Thomasville in 1908.

—(*From Proceedings, 1907.*)

*Idaho.*—The Organization Meeting of the Idaho Pharmaceutical Association was held at Boise—starting off with 156 charter members—May 20-21, 1907. R. W. Smith, of Mountainhome, was elected President; J. B. Latimer, of Boise, Secretary.

The Association adjourned to meet at Boise, May 22, 1908.

—(*From Drugg. Circ., July, 1907.*)

*Illinois.*—The Twenty-eighth Annual Meeting of the Illinois Pharmaceutical Association was held at Galesburg, June 25 to 27, 1907, in three sessions. John J. Boehm, of Chicago, was elected President; W. B. Day, of Chicago, Secretary. The following papers were read:

"'To Live and Let Live'—The N. A. R. D. True to Its Motto," by T. V. Wooten.

"How to Increase the Interest of the Medical Profession in the U. S. Pharmacopœia and National Formulary." Three papers, by Ralph E. Dorland, by H. F. Schafer, and by Wilhelm Bodemann.

The Association adjourned to meet at Peoria in 1908.

—(*From Proceedings, 1907.*)

*Indiana.*—The Twenty-sixth Annual Meeting of the Indiana Pharmaceutical Association was held at Evansville, June 18 and 19, 1907, in six sessions. Louis Teppe, of Evansville, was elected President, A. Timberlake, of Indianapolis, Secretary. An interesting report on adulterations was received and discussed. The following papers were read:

"Circulatory Displacement," by Leo Eliel.

"Pharmacy and the Future," or "The Future of Pharmacy," by J. N. Hurty.

"Address of the State Food and Drug Commissioner," by H. E. Barnard.

The Association adjourned to meet at Lake Wawasee in 1908, if suitable arrangements can be made. (*From Proceedings, 1907.*)

*Iowa.*—The Twenty-eighth Annual Meeting of the Iowa Pharmaceutical Association was held at Clinton, June 9-11, 1907, in three sessions. Geo. H. Boyson, of Cedar Rapids, was elected President; J. M. Lindley, of Winfield, Secretary. The following papers were read:

"How to Increase the Interest of the Medical Profession in the U. S. P.," by E. L. Maffett.

"What is Your Plan by Which Medicine Wagon Competition may be Reduced?" Two papers, by R. W. Harvey and by E. L. Maffett.

"What is the Best Method of Influencing Physicians to Prescribe National Formulary Preparations?" Two papers, by E. L. Maffett, and by A. H. Miles.

"What is the Therapeutic Value of Olive Oil?" by R. W. Harvey.

"What is Your Plan by Which Your Husband May Enjoy an Evening or Two off each Week?" (a poem), by Mrs. Richard Gerlach.

"A Few Ideas from a 'Woman's Business Standpoint' not a 'Business Woman's Standpoint,' Relating to Our Profession," by Mrs. F. Russell.

The Association adjourned to meet at Dubuque, July 7-9, 1908.

—(*From Proceedings, 1907.*)

*Kansas.*—The Twenty-eighth Annual Meeting of the Kansas Pharmaceutical Association was held at Kansas City in Kansas, May 21-23, 1907, in six sessions. E. B. Malot, of Abilene, was elected President; A. E. Topping, of Overbrook, Secretary. An interesting report was presented by the Committee on Adulterations. No papers were read at this meeting. The Association adjourned to meet at Wichita, May 26-28, 1908.

—(*From Proceedings, 1907.*)

*Kentucky.*—The Thirtieth Annual Meeting of the Kentucky Pharmaceutical Association was held at Olympian Springs, June 18-21, 1907, in four sessions. G. O. Patterson, of Hawesville, was elected President; J. W. Gayle, of Frankfort, Secretary. The following papers were read:

"Denatured Alcohol—What Advantages, If Any, Does it Present to the Retail Druggist?" by Addison Dimmitt.

"Local Druggists' Associations—Why They Should be Encouraged." Two papers: by Simon N. Jones and by L. G. Smith.

"U. S. P. and N. F. Preparations *vs.* Proprietary Ones." Four papers: by Addison Dimmitt, by Simon N. Jones, by Herman H. Koegel and by Wm. F. Landrum.

"What Pharmaceutical Preparations Can a Busy Druggist Manufacture, etc., Which Will Prove Profitable to Him?" by J. O. Cook.

"How Best to Train Apprentices to be Efficient Druggists, Good Salesmen and Honorable Citizens." Two papers: by J. W. Gayle and by W. F. Landrum.

"Should Our State Pharmacy Law Require Applicants for Registration to be Graduates in Pharmacy?" Two papers: by Gordon L. Curry and by Simon N. Jones.

"The Antiseptic Kiss." Two papers, by Mrs. J. O. Cook and by Mrs. C. A. Leathers.

"Brain Storms we have Passed Through and Exaggerated Echoes we have Met," by George Budde.



"Buying Club for Druggists in Each Community : Its Advantages," by Simon N. Jones.

"Purity Rather than Price the Prime Consideration." Two papers, by L. L. Elgin and by J. W. Gayle.

"How to Run a Soda Fountain," by H. H. Koegel.

The Association adjourned to meet in June, 1908, date and place to be determined by the Executive Committee (Estill Springs, June 16-19).

(*From Proceedings, 1907.*)

*Louisiana.*—The Twenty-fifth Annual Meeting of the Louisiana Pharmaceutical Association was held in New Orleans, May ———, 1907, in ——— sessions. A. Villeret, of Bayou Sara, was elected President ; George W. McDuff, of New Orleans, Recording Secretary.

The Association adjourned to meet at ——— in 1908.

—(*From Merck's Rep., July, 1907.*)

*Maine.*—The Fortieth Annual Meeting of the Maine Pharmaceutical Association was held at Portland, Me., and Magnolia, Mass., June 18 and 20, 1907, in three sessions, the last session being held jointly with the Allied Pharmaceutical Associations of New England at Magnolia. O. W. Jones, of Auburn, was elected President ; M. L. Porter, of Danforth, Secretary. The business transacted was mainly routine. No papers were read. The Association adjourned to meet at the Mount Kineo House, June 23-25, 1908. (*From Proceedings, 1907.*)

*Maryland.*—The Twenty-fifth ("Silver Jubilee") Annual Meeting of the Maryland Pharmaceutical Association was held on board the S. S. Atlanta and at the Jamestown Exposition, June 25 to 28, 1907, in four sessions. Owen C. Smith, of Baltimore, was elected President ; E. F. Kelly, of Baltimore, Secretary. An interesting report on adulterations was presented by H. L. Troxell, Chairman of the Adulteration Committee. No papers were presented at this meeting. The Association adjourned to meet at Ocean City, June 23-26, 1908. (*From Proceedings, 1907.*)

*Massachusetts.*—The Twenty-fifth ("Silver Jubilee") Annual Meeting of the Massachusetts State Pharmaceutical Association was held at Magnolia, June 18-21, 1907, in four sessions. C. H. Packard, of East Boston, was elected President ; James F. Guerin, of Worcester, Secretary. The Association adjourned to meet at ——— in 1908.

—(*From The Apothecary, July, 1907.*)

*Michigan.*—The Twenty-fifth Annual Meeting of the Michigan Pharmaceutical Association was held at Bay City, July 30 to August 1, 1907, in — sessions. F. E. Bogart, of Detroit, was elected President ; E. E. Calkins, of Ann Arbor, Secretary. The following papers were read :

"Facts and Features of the Soda Water Business," by E. L. Keyser.

"Pharmacy and Pharmacists from an Ethical and Right Point of View," by William Heim.

Interesting addresses were also delivered (at the annual banquet) on :

"The M. S. P. A.," by W. G. Burke.

"Membership," by E. E. Calkins.

"Pharmacy and the Law," by I. N. Kinney.

"Experience With a Chain of Stores," by A. S. Parker.

The Association adjourned to meet at Lansing in 1908.

—(*From Drugg. Circ., Sept., 1907.*)

*Minnesota.*—The Twenty-third Annual Meeting of the Minnesota State Pharmaceutical Association was held at St. Paul, June 18–20, 1907, in six sessions. H. T. Holverson, of Alexandria, was elected President; Theo. F. Leeb, Winona, Secretary. Interesting reports were presented: On the Revision of the U. S. Pharmacopœia, by Frederick J. Wulling; On Adulterations, by Gustav Bachman; and, On the College of Pharmacy, by Chas. T. Heller. The following papers were read:

"The College of Pharmacy—Historical" (continued from 1906), by Frederick J. Wulling.

"On the Other Side," by A. D. Thompson.

"On Legislative Enactment Regarding the Sale of Poisons," by A. J. Kline.

"How to Convert Metric into Apothecaries' Measure," by Chas. T. Heller.

"A Warning Against Careless Drug and Food Legislation," by Frederick J. Wulling.

The Association adjourned to meet at Alexandria in 1908.

—(*From Proceedings, 1907.*)

*Mississippi.*—The Fifth Annual Meeting of the Mississippi Pharmaceutical Association was held at Gulfport, July 24–25, 1907, in ——— sessions. S. L. Caine, of Columbus, was elected President; O. W. Bethea, of Meridian, Secretary.

The Association adjourned to meet at ——— in 1908.

—(*From Drugg. Circ., Sept., 1907.*)

*Missouri.*—The Twenty-ninth Annual Meeting of the Missouri Pharmaceutical Association was held at Pertle Springs, Warrensburg, June 12–14, 1907, in six sessions. J. V. Murray, of Warrensburg, was elected President; Dr. H. M. Whelpley, of St. Louis, Secretary. A highly interesting and exemplary report was made by W. H. Lamont, Chairman of the Committee on Membership and Attendance. The following papers were read:

"The Irish Medicine Man," by J. F. Llewellyn.

"The Identification of Pharmaceutical Preparations," by Dr. H. M. Whelpley.

"Soluble Manganese Citrate, N. F.," by Francis Hemm.

"The Mo. Ph. A. Meeting of 1882," by Dr. H. M. Whelpley.

"Demonstration of U. S. P. Process for Preparation of Spirit of Nitrous Ether," by Professor Francis Hemm.

"Elixir Glycerophosphates Compound," by Professor D. V. Whitney.

"Pharmaceutical Education," by Wm. H. Lamont.

"A Comprehensive Outline of Commercial Pharmacy," by W. H. Lamont.

"Drug Adulteration," by J. F. Lewellyn.

"Timely Topics," by Dr. H. M. Whelpley.

"How Can we interest the Physicians in the United States Pharmacopœia," by Francis Hemm.

"The Drug Business in Missouri in Earlier Days," by F. R. Dimmitt.

"Where is the Drug Business most Profitable—in the City or in the Country?" by Ambrose Mueller.

"Drug Adulteration," Report by Dr. Chas. E. Caspari.

"National Formulary," Report by Professor D. V. Whitney.

"Spirit of Nitrous Ether," by Professor D. V. Whitney.

"United States Pharmacopœia," Report on Group I, by Wm. Mittelbach; Group II, by Otis W. Smith; Group III, by C. M. Riley; Group IV, by Dr. H. M. Pettit; Group V, by Paul L. Hess.

The Association adjourned to meet at Pertle Springs, Warrensburg, June 16-19, 1908.—(*From Proceedings, 1907.*)

*Montana.*—The — Annual Meeting of the Montana Pharmaceutical Association was held at Butte, Aug. 8, 1907, in — sessions. Lee Warren, of Billings, was elected President; E. A. Hauser, of Butte, Secretary.

The Association adjourned to meet at Billings in 1908.

—(*From Drugg. Circ., Sept., 1907.*)

*Nebraska.*—The Twenty-sixth Annual Meeting of the Nebraska Pharmaceutical Association was held at Seward, June 18-20, 1907, in — sessions. D. L. Killian, of Adams, was elected President; Oscar Baumann, of Grand Island, Secretary.

The Association adjourned to meet at Omaha in 1908.

—(*From Drugg. Circ., Sept., 1907.*)

*New Hampshire.*—The Thirty-fourth Annual Meeting of the New Hampshire Pharmaceutical Association was held at Magnolia, Mass., June 19-21, 1907, in three sessions—the last session being held in a joint meeting of the Allied Pharmaceutical Associations of New England. George W. Nutter, M. D., of Salmon Falls, was elected President; Herbert E. Rice, of Nashua, Secretary. The principal business at this meeting was of a routine nature. At the joint meeting an interesting paper was read by C. H. Davis, Chairman of the Maine Board of Pharmacy; an address was delivered by Congressman Frank D. Currier, of New Hampshire, the author of the Currier bill to regulate patents, and Mr. Zottman, of Vermont, communicated a paper on the Conditions of Pharmacy in the Green Mountain State. Mr. S. A. D. Sheppard, of Massachusetts, and Mr. D. F. Davis, of —, also gave interesting talks on similar topics.

The Association adjourned to meet at Newport, N. H., June 23-25, 1908. (*From Proceedings, 1907.*)

*New Jersey.*—The Thirty-seventh Annual Meeting of the New Jersey Pharmaceutical Association was held at Asbury Park, June 12-14, 1907, in four sessions. H. H. Deakyne, of Atlantic City, was elected President; Frank C. Stutzlen, of Elizabeth, Secretary. Interesting reports received were those of the Procter Memorial Committee and of the Committee on U. S. Pharmacopœia. The following papers were read:

"Fluidglycerate of Krameria," by George M. Beringer.

"Lecithin— $C_{42}H_{84}NO_3P$ ," by Prof. P. E. Hommell.

"Chemical Exposé of Albuminoid Derivatives," by Prof. P. E. Hommell.

"Some U. S. P. Suggestions," by Prof. P. E. Hommell.

"The National Formulary as a Legal Standard and Some of Its Defects," by George M. Beringer.

"A Historical Sketch of the New Jersey Pharmaceutical Association," by Edward A. Sayre.

"The New Jersey Food and Drugs Act," by Fred. B. Kilmer.

The Association adjourned to meet at Atlantic City in June, 1908.

—(*From Proceedings, 1907.*)

*New York.*—The Twenty-ninth Annual Meeting of the New York State Pharmaceutical Association was held at Thousand Island Park, June 25-29, 1907, in five sessions. C. L. McBride, of Kingston, was elected President; E. S. Dawson, of Syracuse, Secretary. Interesting reports were received from the following committees: On Pharmacy and Queries, On Adulteration, and On New Remedies. The following papers were read:

"How to Increase the Interest of the Medical Profession in the U. S. Pharmacopœia"—four papers—by Jacob Diner, by Otto Wicke, by Fred. H. Mason, and by David Stolz.

"Friendly Comments on the U. S. Pharmacopœia," by Dr. Alfred I. Cohn.

"The Nostrum," by Francis B. Hays.

"The Characteristics of the 'Buttinskys' and the 'Trolleyoffs,'" by Judson B. Todd.

"A Druggist's Protective Association," by Otto A. Wicke.

"The Manufacturing of Certain Pharmaceutical Preparations," by E. S. Dawson, Jr.

"The Scarcity of Drug Clerks," by George Reiman.

"On Solution of Magnesium Citrate," by Otto Raubenheimer.

The Association adjourned to meet at the Mountain House, in the Catskills, in 1908.—(*From Drugg. Circ., July, 1907.*)

*North Carolina.*—The Twenty-eighth Annual Meeting of the North Carolina Pharmaceutical Association was held at Lake Toxaway, June 13-

14, 1907, in three sessions. Chas. R. Thomas, of Thomasville, was elected President; P. W. Vaughan, of Durham, Secretary. The following papers were read:

"How to Get the Physician to Use U. S. P. and N. F. Preparations in His Prescriptions Instead of the Proprietaries," by Geo. Y. Watson.

"How Can We Secure a Greater Attendance at the Meetings of the North Carolina Pharmaceutical Association?" by Chas. H. Thomas.

"Pharmacy—A Profession or Trade—Which?" by Gilbert Crabtree.

"The Pharmacopœia and National Formulary," by Wm. H. Blauvelt.

"Alkaloidal Tests," by Donah Josiah Atkins.

"Coal-Tar Products," by David Simeon Chapman.

"The Drugs and Their Derivatives Included in the Pure Food and Drug Law, and Some Practical Tests for Their Identification," by Ralph Emory Kibler.

The Association adjourned to meet at Moorehead City, July 8 to 10, 1908.—(*From Drugg. Circ., Sept., 1907.*)

*North Dakota.*—The Twenty-Second Annual Meeting of the North Dakota Pharmaceutical Association was held at Fargo, August 6–8, 1907, in — sessions. J. W. Boening, of Berthold, was elected President; W. S. Parker, of Lisbon, Secretary and Treasurer. Addresses were delivered on:

"The Pure Food and Drug Law," by Prof. E. F. Ladd.

"The Importance of Drug-Testing and Analysis in the Retail Store," by Prof. L. A. Brown.

"Uniform Standards of Requirements for Registered Pharmacists," by W. G. Noyes.

The Association adjourned to meet at Devil's Lake in 1908.

—(*From Drugg. Circ., Sept., 1907.*)

*Ohio.*—The Twenty-ninth Annual Meeting of the Ohio State Pharmaceutical Association was held at Cedar Point, July 9–12, 1907, in three sessions. W. O. Lemaster, of Akron, was elected President; Theo. D. Wetterstroem, General Secretary. Interesting reports were received from the Committee on Adulteration and Sophistication, On History of Pharmacy in Ohio, On Pharmaceutical Education, and On Unofficial Formulæ. The following papers were read:

"The Scientific Aspect of Pharmacy," by L. H. Witte.

"Tinctures from Fluidextracts," by Joseph Feil.

"How Can the Public be Taught to Distinguish Between the Legitimate Pharmacist and the Imitation Druggist?" by J. H. Beal.

"A Compilation of All Laws Upon the Ohio Statute Books Related to the Sale of Drugs," by N. Rosewater.

The Association adjourned to meet at Cedar Point, July 10–13, 1908.

—(*From Proceedings, 1907.*)

*Oklahoma-Indian Territory.*—A joint meeting of the Oklahoma and Indian Territory Pharmaceutical Associations was held at Oklahoma City, O. T., May 8–10, 1907. Some of the sessions were presided over by President Scott, of the Oklahoma Association, and the others by President Humphrey, of the Indian Territory Association. The executive sessions were held separately. L. A. Fraser, of Elk City, O. T., was elected President of the Oklahoma Association; W. H. McCutcheon, of Luther, O. T., Secretary and Treasurer. Over 500 members were present at this Convention, which adjourned to meet in 1908 at a time and place to be determined by a committee of three members from each Association, appointed for the special duty.—(*From Amer. Druggist, June, 1907.*)

*Oregon.*—The Seventeenth Annual Meeting of the Oregon Pharmaceutical Association was held at Seaside, July 10–11, 1907, in — sessions. C. G. Huntley, of Oregon City, was elected President; A. W. Allen, of Portland, Secretary.

The Association adjourned to meet in 1908, time and place to be determined by the Executive Committee.

—(*From Drugg. Circ., Sept., 1907.*)

*Pennsylvania.*—The Thirtieth Annual Meeting of the Pennsylvania Pharmaceutical Association was held at Bedford Springs, Bedford, June 18–20, 1907, in six sessions. Clement B. Lowe, of Philadelphia, was elected President; Jacob A. Miller, of Harrisburg, Secretary. Interesting reports were received from the Committee on Adulterations and the Committee on Botany. The following papers were read:

- "A Hand Me Down Conscience," by B. E. Pritchard.
- "Cataplasm of Kaolin," by I. V. S. Stanislaus.
- "Chemistry in the Store Window," by F. P. Stroup.
- "Dispensing Physicians and Prescribing Pharmacists," by T. H. Potts.
- "Doctor of Pharmacy," by J. S. Gleghorn.
- "Elevation of Pharmacy," by W. G. Greenawalt.
- "Glycerin Suppositories," by H. C. Blair.
- "Glyceritum Tonicum Compositum," by F. M. Apple.
- "Gurjun Balsam in Copaiba (Test)," by C. E. Vanderkleed.
- "How to Write a Paper," by J. W. England.
- "Incompatibility of Resorcin and Liquid Petrolatum," by L. L. Walton.
- "Is it Good for a Pharmacist to Have a Hobby?" by W. O. Frailey.
- "Is there Any Reason Why Pharmacists Should Sell Postage Stamps?" by J. L. White.

"Knights of the Mortar and Pestle," by Grace F. McMurtrie.

"Laboratory Notes," by Willard Graham.

"Liquid Soap," by I. V. S. Stanislaus.

"Liquor Potassii Arsenitis," by E. Fullerton Cook.

"Manufacture of Perfumery," by I. V. S. Stanislaus.

"Modifying Milk Mixtures," by R. H. Lackey.

"Notes on the Action of Some Antiseptics," by H. Leffman.

"Popularizing N. F. Preparations"—four papers: by O. W. Osterlund, by R. H. Lackey, by L. E. Hastings, and by F. E. Niece.

"Popularizing U. S. P. Preparations"—two papers: by E. E. Heffner, and by W. O. Frailey.

"Proprietaries from a Pharmacist's Standpoint," by C. Koch.

"Powder Folder," by J. Percy Remington.

"Solution of Acid Phosphates," by C. E. Vanderkleed.

"Some Everyday Problems," by C. B. Lowe.

"Souvenir Post Cards," by Jacob Eppstein.

"Standardizing of Diphtheria Antitoxin," by W. A. Pearson.

"Urinalysis as an Advertisement," by E. E. Heffner.

"What Should an Applicant for Qualified Assistant Pharmacist be Required to Know?" by L. L. Walton.

A communication concerning National and State legislation, the U. S. P. and National Formulary, and the Pure Food and Drug Act, was received from J. P. Remington.

The Association adjourned to meet in Paxinosa Inn, at Easton, June 23-25, 1908.—(*From Proceedings, 1907.*)

*Rhode Island.*—The Rhode Island Pharmaceutical Association holds quarterly meetings. At the meeting in January, 1908, Howard A. Pearce, of Providence, was elected President; Charles H. Daggett, of Providence, Secretary. (*From Pharm. Era, Jan. 16, 1908.*)

*South Carolina.*—The Thirty-first Annual Meeting of the South Carolina Pharmaceutical Association was held at the Isle of Palms, June 19-20, 1907, in — sessions. C. A. Milford, of Abbeville, was elected President; F. M. Smith, of Charleston, Secretary and Treasurer. A number of interesting and instructive papers were read and discussed during the meeting. The Association adjourned to meet at ——— in 1908.

—(*From Drugg. Circ., Aug., 1907.*)

*South Dakota.*—The Seventeenth Annual Meeting of the South Dakota State Pharmaceutical Association was held at Huron, August 14-16, 1907, in four sessions. S. H. Scallin, of Mitchell, was elected President; E. C. Bent, of Dell Rapids, Secretary. The following papers were read:

"Historical Reminiscences," by I. A. Keith.

"How does the New Pure Food and Drug Law Affect the Pharmacist?" by F. G. Stickles.

"Best Methods of Handling Cash and Credit Sales in a Drug Store," by L. T. Dunning.

"In the Examination of Candidates for Registration by the Board of Pharmacy, What Constitutes the Highest Points of Efficiency in Determining their Qualifications as Pharmacists," by D. F. Jones.

The Association adjourned to meet at Watertown, August 12-14, 1908.

—(*From Proceedings, 1907.*)

*Tennessee.*—The Twenty-second Annual Meeting of the Tennessee Pharmaceutical Association was held at Monteagle, July 16-18, 1907, in five sessions. M. E. Hutton, of Nashville, was elected President; E. F. Trollinger, of Nashville, Treasurer. The following papers were read:

"Better Organization," by Frank W. Ward.

"Are Pharmacy Laws a Benefit or a Detriment to the Community and the Pharmacist?" by Ira B. Clark.

"Duties, Both Moral and Compulsory, of Employer to Clerk and Clerk to Employer," by W. I. Gates.

"What the Druggist Should Not Take Back," by Samuel C. Davis.

"Drug Adulterants—In View of the Pure Food Law, What Should the Pharmacist Guard Against?" by S. C. Davis.

"Does a Soda Fountain Pay the Average Druggist?" by Jesse L. Nelson.

"Where Should the Line Be Drawn Between Physician and Druggist in Counter Prescribing," a paper by J. E. Justice, and a letter by Dr. R. L. Burks.

"Why Druggists Should Encourage the Use of First Class Garden Seed," by W. I. Gates.

"Why Should the Druggist Encourage the Growth of Medicinal Roots, etc.?" by Geo. S. Alcorn.

"How to Increase the Interest of the Medical Profession in the U. S. Pharmacopœia," by J. E. Justice.

The Association adjourned to meet the third Tuesday in July, 1908, at some place to be selected by the Executive Committee.

—(*From Proceedings, 1907.*)

*Texas.*—The Twenty-eighth Annual Meeting of the Texas Pharmaceutical Association was held at Waco, June 18-20, 1907, in six sessions. J. E. Coulson, of Corsicana, was elected President; R. H. Walker, of Gonzales, Secretary-Treasurer. The following papers were read:

"Pure Food and Drug Legislation," by E. G. Eberle.

"Analysis of the Pure Food and Drugs Act," by E. M. Wells.

"Denatured Alcohol," by E. G. Eberle.

"What Shall It Be—The Commercial or the Scientific Pharmacist?" by C. B. Gunn.

"Reminiscence," a poem by Walter H. Cousins.

"Dispensing Notes and a Few Comments on the National Formulary," by O. L. Ferrel.

"Sunday Closing for the Druggist," by T. P. Eastland.

"Syrup of Wild Cherry," by J. C. Buckner.

"Why Proprietors Prefer Graduates in Pharmacy Who Have had Practical Drug Store Experience," by M. R. Bruckner.



"Manufacturing Specialties for Your Employer," by H. M. Vaughn.

"Buying," by Kirk D. Holland.

"Commercialized Pharmacy," by R. H. Needham.

"The Prescribing and Dispensing of Proprietary Medicines," by John Page.

Two papers, in lighter vein ("Billy, He's in Trouble," and "A Composition on Cow"), were read by Secretary Walker, who claimed that they were "anonymous."

The Association adjourned to meet at Galveston, June 16-18, 1908.

—(*From Proceedings, 1907.*)

*Utah.*—The Seventh Annual Meeting of the Utah Pharmaceutical Association was held at Salt Lake, August 13-14, 1907, in several sessions. Alexander Hedquist, of Provo, was elected President; J. A. Johnson, of Salt Lake, Secretary. An exhibit of twenty-five preparations of the National Formulary, arranged by the local association, occasioned much favorable comment. The following papers were read and discussed:

"What is the Best Method of Influencing Physicians in Prescribing National Formulary Preparations?" by A. A. Robinson.

"How Would You Proceed to Make a Good Salesman Out of Your Clerk?" by Richard Bridge.

"Is the Rapidly Growing Post-Card and Souvenir Business a Detriment or an Advantage to the Professional Pharmacist?" by W. H. Dayton.

"Can Pharmacy be elevated to Its Proper Professional Plane as Long as the Pharmacist Serves as an Accommodation to the Public," by J. H. Bishop.

"How Many of the Important Preparations of the National Formulary Have You Made Up in Anticipation of a Demand for Them?" by Charles Dee.

"Substitution," by A. Hatch, Jr.

"What New Ideas Regarding Window Displays Have You Used During the Past Year?" by A. S. Horne.

The Association adjourned to meet at Provo in 1908.

—(*From Drugg. Circ., 1907.*)

*Vermont.*—The Fourteenth Annual Meeting of the Vermont State Pharmaceutical Association was held at Magnolia (Mass.), June 19-21, 1907, in four sessions, the last session being held jointly with the Allied Pharmaceutical Associations of New England. D. F. Davis, of Barre, was elected President; W. E. Terrill, of Montpelier, Secretary. Routine business only was transacted. The Association adjourned to meet in 1908 at a time and place to be determined by the Board of Directors.

—(*From Proceedings, 1907.*)

*Virginia.*—The Twenty-sixth Annual Meeting of the Virginia Pharmaceutical Association was held at Richmond, September 23-25, 1907, in —

sessions. W. G. Williams, of Charlotte Court House, was elected President ; C. B. Fleet, of Lynchburg, Secretary. The Association adjourned to meet the second week in July, 1908, aboard one of the Old Dominion Line steamers for New York, where the sessions will be concluded.

—(*From Drugg. Circ., Oct., 1907.*)

*Washington.*—The Eighteenth Annual Meeting of the Washington State Pharmaceutical Association was held at Moclip Beach, July 18–20, 1907, in — sessions. A. W. Preston, of Seattle, was elected President ; W. P. Bonney, of Tacoma, Secretary. The Association adjourned to meet at — in 1908. (*From Drugg. Circ., Sept., 1907.*)

*West Virginia.*—The First Annual Meeting of the West Virginia State Pharmaceutical Association was held at Wheeling, June 11 and 12, 1907, in three sessions. E. Bruce Dawson, of Wheeling, was elected President ; Arch. Krieg, of Charleston, General Secretary. This being the first annual meeting of this State Association, most of the business transacted was of a routine character, reports being received and discussed from the Committees on Trade Conditions and Interests, on Pharmacy and Legislation, and on Resolutions. Standing committees were appointed : On Pharmacy Laws and Legislation ; On Trade Interests ; On Papers and Queries ; On Adulterations and Sophistications ; On Pharmaceutical Education ; On Press and Publicity. Interesting addresses were delivered and papers were read as follows :

“On the New West Virginia Pharmacy Law,” by Professor J. H. Beal.

“On the Campaign for U. S. P. and N. F. Preparations,” by Dr. Andrews.

“A Practical Pharmaceutical Education,” by F. P. Landon.

The Association adjourned to meet at Charleston, at some time between the 1st and 15th of June, 1908.—(*From Proceedings, 1907.*)

*Wisconsin.*—The Twenty-seventh Annual Meeting of the Wisconsin Pharmaceutical Association was held at Elkhart Lake, June 25–28, 1907, in five sessions. P. H. Sharp, of Oconto Falls, was elected President ; Henry Rollman, of Chilton, Secretary. The following papers were read :

“Some Practical Hints,” by A. R. Eberle.

“Pharmaceutical Education,” by Henry Roemheld.

“Drug-Store Advertising,” by L. G. J. Mack.

“Drugs in History,” by Otto A. Svell.

“How Best to Interest the Physicians in the N. F. and U. S. P. Preparations,” by A. C. Woerfel.

The Association adjourned to meet at Elkhart Lake in 1908.

—(*From Proceedings, 1907.*)

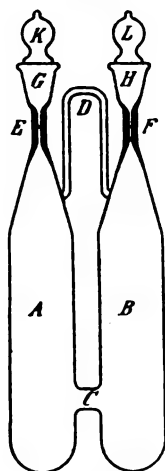
# PHARMACY.

## A. APPARATUS ON MANIPULATIONS.

### *A New Pycnometer—Construction Insuring Accurate Determinations.—*

W. R. Bonsfield has devised the pycnometer shown by Fig. 1, which is designed for accurate specific gravity determinations.

FIG. 1.

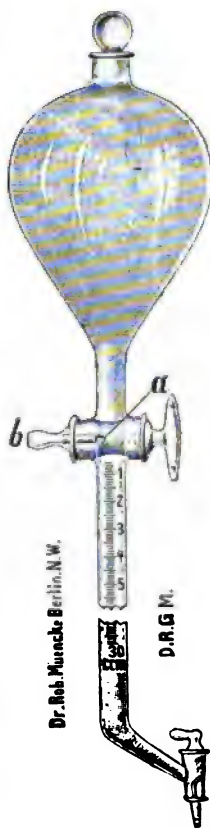


**A New Pycnometer.**

It is composed of two containers, *A* and *B*, which are joined and communicate at *C* by a short tube, and are further united by a stirrup, *D*, by means of which the apparatus is suspended in the thermostat. The conical necks of the containers *A* and *B* are constricted to capillary dimensions at *E* and *F*, and thence expanded into cups *G* and *H*, which are closed with ground glass stoppers, *K* and *L*. In use, these stoppers are replaced by others, which are provided with bent suction-tubes, by means of which the liquid may be introduced either by suction with the mouth or with the aspirator. When filled to the capillaries, the pycnometer is suspended in the thermostat, and, when at the proper temperature, any excess is removed by the aid of blotting paper, the cups are dried carefully in the same way, the stoppers are inserted, and the pycnometer contents weighed.—*Pharm. Ztg.*, liii (1908), No. 44, 437; from *Journ. Chem. Soc.*, 93, 679.

*New Titration Apparatus—Combination of Burette and Reservoir.*—R. Goldschmidt has devised the combined burette and reservoir, illustrated by Fig. 2, which is supplied by a Berlin manufacturer. In this apparatus the reservoir for the titrating fluid is united with the burette by a three-way cock, the large bore, at *a*, serving for the communication between the reservoir and burette, while the small bore, *b*, establishes communication with the outer air.—*Pharm. Ztg.*, lii (1907), No. 56, 584; from *D. Med. Wschr.*, 1907, No. 25.

FIG. 2.



**Titration Apparatus.**

*Safety Pipette—New Sterilizable Form.*—T. Schumm has devised the

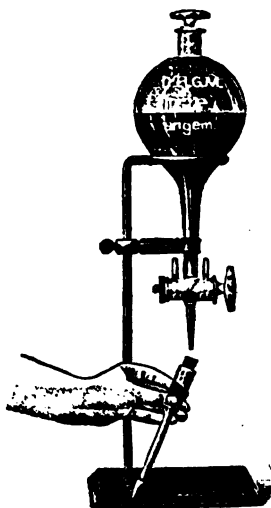
safety pipette shown by Fig. 3, which is supplied by a Hamburg firm, both plain and graduated. The pipette, which is sterilizable, is intended for operation with poisonous, corrosive or nauseous liquids, its construction, as is self-evident, being such as to prevent contact of the liquid with the

FIG. 3.

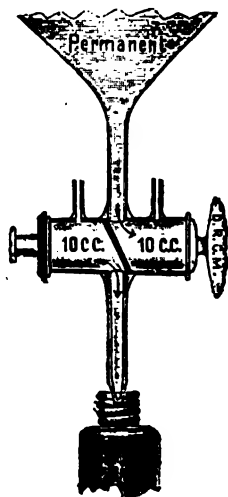


Safety Pipette.

FIG. 4.



Automatic Measuring Funnel.



mouth when suction is applied in the usual manner.—Pharm. Ztg., lii (1907), No. 56, 584; from Münch. Med. Wschr., 1907, No. 25.

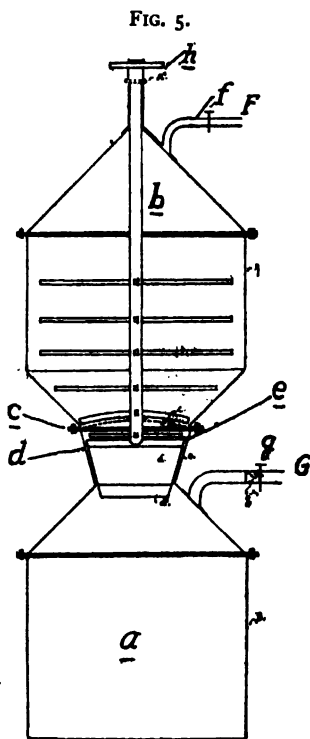
*Automatic Measuring Funnel—A New Device.*—The accompanying cut (Fig. 4) exhibits a new device for automatically measuring small uniform quantities of liquids expeditiously and accurately. It is so constructed that by turning a cock one chamber of 10 Cc. capacity is filled from the reservoir, while a second chamber of the same dimensions is being emptied. It is manufactured by Funke & Co., Berlin.—Amer. Drugg., July 8, 1907; from Vierteljahrschr. f. prakt. Pharm., 1907, 73.

*Percolation.*—I. W. Brandel and Ed. Kremers continue the elaborate and comprehensive chronological review of the process of percolation in Pharm. Rev. 1907, No. 8 (pp. 242-245), No. 9 (pp. 273-275), No. 10 (pp. 317-320), No. 11 (pp. 346-348), and 1908, No. 2 (pp. 51-55) and No. 3 (pp. 74-75).

*Circulatory Displacement—Simple Contrivance for Conducting the Process.*—Leo Eliel, referring to Mr. Alpers's suggestions on the convenience of circulatory displacement for effecting solutions of certain substances (see Proceedings, 1906, 506-507), describes the simple contrivance which he has advantageously employed for this operation. It is a test-tube,  $2\frac{1}{2}$  by 8 inches, with perforations for the circulatory movement, which is

suspended in a cylinder of proper diameter, about 18 inches high, accommodating about 500 Cc. of the solvent. Proc. Indiana Pharm. Assoc., 1907, 17.

*Pressure Percolator for Fluidextracts—Details of Construction.*—G. Marpmann recommends the apparatus shown by Fig. 5, which is well adapted to the extraction of vegetable as well as animal substances in the preparation of fluidextracts. Its construction is such that the extraction can be conducted under pressure in an atmosphere of  $\text{CO}_2$  or  $\text{N}$ , whereby putrescence of the material is prevented, and the separation of the soluble substances from the insoluble parts is quickly effected. The pressure-gas flask is connected with the tube *F*, and the inflow regulated by the cock *f*. The upper part of the apparatus is provided with a revolving shaft, *b*, fitted air-tight through the apex and resting on a firm base, which is joined at *C* with the reservoir *A*, a wire sieve (*d*) and asbestos filter (*e*) being interposed. The shaft is provided with a number of horizontal spokes and a scraper near the bottom; it is rotated by the aid of the pulley *h*, and thus keeps the contents of the percolator in continuous motion, the sieve-meshes being kept open by the scraper, while the percolate filters clear through the asbestos. If the receiving vessel is connected with a suction pump by means of the tube *G*, the contents of the percolator are rapidly and completely exhausted to dryness, the valve *g*, preventing a return of the pressure.—Pharm. Ztg., liii (1908), No. 22, 220.

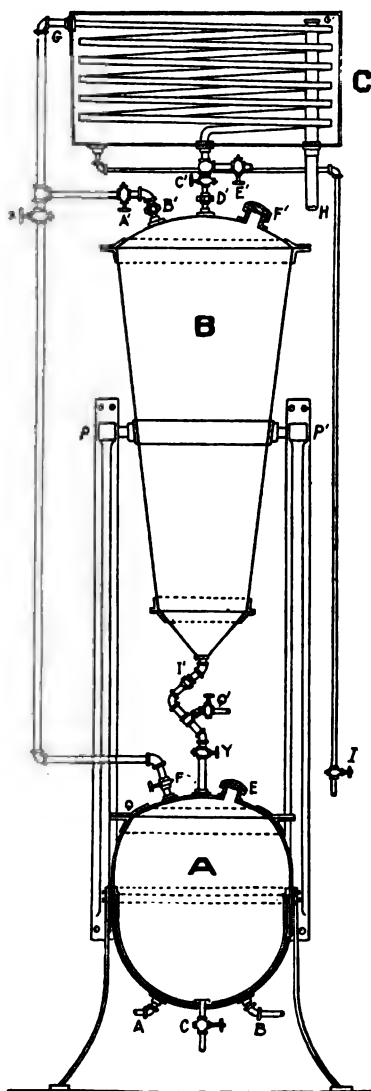


Pressure Percolator.

*Automatic Extraction Apparatus—A Design for Industrial Purposes.*—John W. Forbing has designed the automatic extraction apparatus, the details of which are illustrated by Fig. 6, and recall the principles embodied in the Soxhlet and other extraction apparatus employed in experimental operations, but here applied to manufacturing on a large scale. The large letter A points out a steam jacketed copper kettle, 2 ft. in diameter and 2½ ft. in height, having a working capacity of about 15 gallons. The small letters A and B are the inlet and outlet pipes (1 in.) for steam; c is a drain for the kettle, while Q represents the flange providing a removable top; E is a tubule through which liquid may be supplied if desirable, and F is an outlet

pipe for vapor. It is provided with a shut-off valve and coupling. This outlet pipe should be about 2 in. in diameter and provided with a magnesium asbestos coating, which assists in preventing condensation of vapor as it rises to the condenser C. The

FIG. 6.



Automatic Extraction Apparatus.

The condenser is preferably to be constructed of copper, with copper coils. It is 3 ft. in diameter and  $1\frac{1}{2}$  ft. in height. The condenser may be suspended to the ceiling by means of pulley blocks; it is provided with an inlet for water I and overflow G'. The inlet pipe may be  $\frac{1}{2}$  in., the overflow or drain pipe should be about 2 in. C' is a 1 in. pipe provided with valve and coupling, which leads the condensed vapor to the percolator B. The percolator is  $5\frac{1}{2}$  ft. in height, 2 ft. wide at top, and tapering to 1 ft. at bottom. These dimensions give approximately a working capacity of from 50 to 75 pounds of drug. At the bottom may be arranged a perforated diaphragm, through which the condensed vapor or menstruum may percolate. A percolator constructed of galvanized iron will serve all ordinary purposes; I' is a 1 in. pipe which leads the percolate to the kettle. The facility with which the apparatus may be operated is thus made apparent. The percolator, which is suspended by means of iron frames P and P', whose arms reach out about  $3\frac{1}{2}$  ft. from the wall in order that the percolator may be revolved, is detached by means of the couplings, and swung to a position to permit of easy packing. After packing, the percolator is swung back into position and menstruum added. The top, as

pointed out by the flanges in the drawing, is then replaced and connected to kettle and condenser by means of the couplings. Should more menstruum be desired after having made connections it may be supplied by

means of the tubule  $r'$ , or it may be added through the kettle tubule and evaporated and condensed. We have then an extraction apparatus which will act automatically. The extractive will be deposited in the kettle and may be drained off when desired in the solution of the menstruum used, or it may be obtained in pure form. Should this be desired the lower valve  $v$  and the upper valve  $c'$  are closed; the valve  $a'$  opened,  $x$  closed, and  $e'$  opened. Thus the evaporated liquid will pass out of the kettle into the condenser, from which it may be collected in whatever place may prove most convenient. This provides the operator with a means of reclaiming the solvents from the percolates. To reclaim the menstruum remaining in the percolated drug, compressed air or steam is forced through the valve  $q'$ , and through drug in percolator, and by means of pipe  $b'$  into condenser, escaping in condensed form through valve  $e'$ .—*Amer. Drugg.*, Dec. 9, 1907, 357-358.

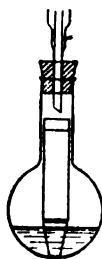
*Soxhlet Extractor—Modification.*—Professor Horatio C. Wood, Jr., has devised the modified Soxhlet extractor shown by Fig. 7, which combines efficiency with economy, less fragility, and easy cleaning, while adapted to processes on any desired scale, depending on the selection of the percolator. It consists of a narrow percolator ( $P$ ), the lower end of which is connected by means of a tightly-fitting cork with a siphon-shaped glass tube ( $S$ ), and the upper end closed with a cork into which a glass "T"-tube is fitted. The upper end of the tube ( $T$ ) is connected with a reflux condenser, the side tube with the tube ( $A$ ), which reaches downward into the biperforated cork, closing the boiling flask ( $F$ ). The application of the apparatus is obvious.—*Amer. Journ. Pharm.*, Mar. 1908, 106.

Soxhlet Extractor.

*Extraction Apparatus — Convenient Construction for Small Quantities.*—Jack-

son and Zanett recommend the simple apparatus shown by Fig. 8 for the extraction of small quantities of material. It consists of a small flask, surmounted by a reflux condenser, and a glass tube, open at both ends, reaching from the bottom of the flask well into its neck. The powder to be extracted is placed upon a disc of filter paper, resting upon a perforated disc (of porcelain) or other suitable support, which must be above the surface-level of the extracting fluid in the flask, the powder being covered by another disc of filter paper. The condenser must, of course, be adjusted so that the condensed solvent will drop into the extraction-tube.—*Pharm. Ztg.*, lii (1907), No. 99, 1061; from *Amer. Chem. Journ.*, 1907, No. 38, 461.

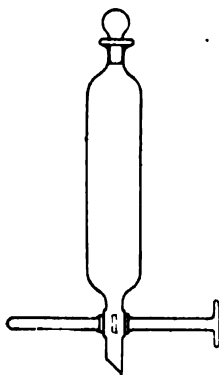
FIG. 8.



Extraction Apparatus.

*Separatory Funnel—Improved Tap.*—P. Soltstein finds that if the axis of the spigot in the separatory funnel is elongated as indicated in the accompanying illustration (Fig. 9), it can be turned with greater facility and the outflow from the top regulated with greater precision than is possible with the apparatus of the usual construction. He has used this form of separatory funnel for a long time, and has found them extremely convenient. Observing the proportions shown in the cut, these funnels may be constructed of any required capacity.—Pharm. Ztg. lii (1907), No. 93, 971.

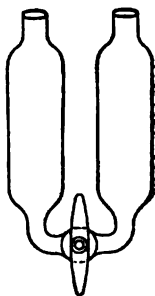
FIG. 9.



Separatory Funnel.

*Double Separatory — A Useful Device.*—Kurt Beysen observes that the process of shaking out with light immiscible liquids, if carried out with the ordinary separatory, necessitates rinsing after each separation, and results in inconveniently increasing the liquid shaken out. This inconvenience is completely obviated by

FIG. 10.



Double Separatory.

use of a double separatory shown by Fig. 10. On opening the cock between the two limbs of the separator, the heavier liquid may be completely withdrawn from the one limb into the other, by inclining the separator or by suction, into the other limb. The convenience of this form of separator manifests itself, for instance, in the possibility of separating the ether layer from the opium extraction in opium assays perfectly—an operation which as conducted under the directions usually prescribed is very difficult to accomplish satisfactorily. By providing two additional borings in the cock the one or the other of the limbs may be emptied through a corresponding opening beneath, but the author considers this additional arrangement unnecessary.—Pharm. Ztg., lii (1907), No. 80, 840.

*Automatic Filter-funnel.—Convenient Construction for Quantitative Analysis.*—H. Leiser has devised the apparatus, shown by Figs. 11 and 12, for automatic filtrations and particularly for washing precipitates in analytical operations, in which he dispenses with the customary double tubes—the one for the exit of the filtering or washing fluid, the other for the admission of air into the supply reservoir. This, instead, is provided with a short, wide, stoppered tube, with a hole in the side, and attached to the neck by means of a bayonet-lock. The glass cock being so constructed internally that, by a simple turn, the hole in the tube may be closed, or opened for the admission of air. The position of the reservoir having been properly adjusted, and the cock turned so as to admit air, the washing proceeds automatically without disturbing the precipitate. Filtration or



washing with hot liquids is readily accomplished by the arrangement as shown by Fig. 12, which requires no further description.—Pharm. Ztg., liii(1907), No. 56, 584; from Ztsch. f. angew. Chem., 1907, No. 24.

FIG. 11.

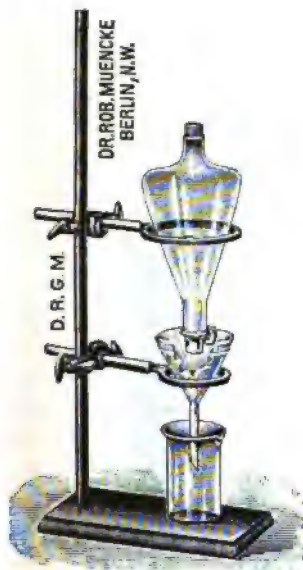
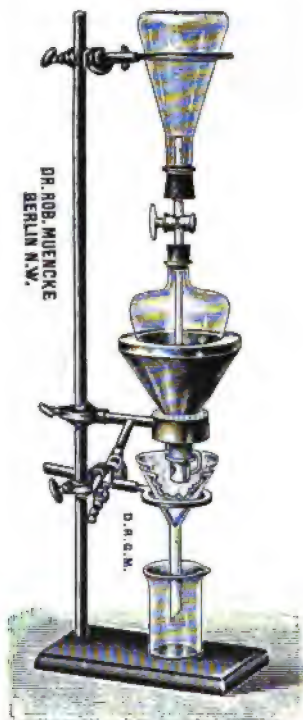


FIG. 12.



Automatic Filter-funnel.

*Filtration on a Large Scale—Convenient and Economical Apparatus.—*

Dr. Justin S. Brewer describes a convenient and economical arrangement of apparatus for continuous filtration on a large scale, which is illustrated by Fig. 13, which may prove useful even to pharmacists who are familiar with the principle on which its utility depends. Two sound alcohol barrels are required. As one barrel must be placed exactly over the other a stronger support must be erected for it. The upper barrel must have all bung and vent holes closed, as the barrel must be impervious to air. In one end of this barrel must be made a hole for a large bung or rubber cork. This hole is used for filling the barrel and for admitting a stirrer. The handle of an old broom serves well as the stirrer, and will be all that is required for thorough agitation. Into a suitable hole in the center of the other end of this same barrel must be screwed a twelve-inch length of three-quarter-inch galvanized-iron pipe threaded at each end. The con-

nection should be made air-tight and non-leakable by securing it strongly with a leather washer and lock-nut. At the other end of this pipe is to be connected an ordinary three-quarter inch valve or shut off and to this, in turn, two feet more of the same kind of pipe. The top barrel is now ready and should be placed on the upper shelf of the stand as shown in the diagram. Barrel number 2 may have one head removed and should be fitted with a loose cover through the center of which a hole should be bored to accommodate the filter. A faucet may be inserted in the side of this barrel, far down, for convenience in filling bottles direct from the

FIG. 13.



Filtration Apparatus.

barrel. The funnel is made from an ordinary five-gallon tin can by removing its bottom. The funnel is to be converted into a filter by cutting a piece of quarter-inch mesh strong galvanized-iron-wire screening to fit into it, this screening to be covered with a layer two inches thick of white filter-mass. This mass must be pressed down firmly and kept in place by another piece of wire mesh on the top. The filter must be adjusted, of course, so that the end of the delivery pipe from the upper barrel will be about one inch above the top of the layer of filter-mass. A cover should be fitted on the top of funnel. To use, close the valve and fill the upper barrel with the preparation to be filtered; insert the bung or cork

so that no air can enter the barrel; open the valve and let the filtration proceed, taking care that the liquid passes bright and clear. Drugg, Circ., April, 1908, 153-154.

*Cellulose Filters—Construction for Large Operations.*—The "Oil Paint and Drug Reporter" gives the following general directions for constructing a filter for continuous operations on a large scale: The filtering medium is the cellulose known in commerce as "filter wool," which is prepared for use by tearing it into small pieces, moistening so as to form a kind of pap, submitting this to boiling by means of steam, and washing on a sieve of very fine meshes. The washed cellulose is introduced into a cylindrical vessel, open at top, fitted at the bottom with an exit tube, and containing a double perforated bottom, on which is a sieve formed of canvas, and stretched on a hoop of iron. The prepared filtering wool, mixed with water, is poured on this sieve, care being taken to obtain as equal a distribution as possible. The tap of the exit tube is opened, the water flows through, and the filtering wool is deposited on the sieve in a uniform layer of from ten to twenty centimeters. The deposit is covered by another sieve, formed like the first, of canvas, stretched over a hoop of iron wire. When the hoop is not exactly fitted to the inside wall of the filter, it is necessary to stop the spaces, with parchment, for instance, in order that the filtering layer, which tends to become diluted and consequently swelled under the action of the filtering liquids, may not mount again, through interstices, above the upper sieve. The filter is then ready for use.—Midland Drugg., Aug., 1907, 1059.

*Filter Papers—Kinds Suitable and Required for Different Pharmaceutical Operations.*—Professor Wilbur L. Scoville, who may be accepted as an authority on the subject, speaking of "Filtering and Filter Papers," recommends the following qualities of papers most useful for different pharmaceutical filtrations:

For alcoholic liquids, a thin and rapidly-acting filter paper is needed, that material loss by absorption or evaporation may be avoided.

For eye-waters, etc., there should be used a firm paper, that will not give off any fuzz or fibers to the liquid, and that will hold back any fine precipitate.

For syrupy and slimy liquids a thick and soft filter is needed—one that will not clog easily, and will work rapidly.

For thick syrups, oils, etc., a still thicker but firm paper is required.

Special work may call for very close filters, that will hold back the finest of precipitates, or the faintest turbidity, but other clarifying agents can be made to accomplish the same result in special cases at the cost of a small waste of the fluid.

These few kinds of filter-papers should be kept in stock, in needed sizes. They are easily obtained, and are economical.—Drugg. Circ., July, 1907, 458.

*Filter Paper—Presence of Copper.*—W. Elborne and C. M. Warren, after an examination of a large number of ordinary commercial filter papers, gray and white, cut and uncut, analytical, pharmaceutical, and technical varieties—indeed, every brand, British and foreign, they have been able to lay their hands upon—have found traces of copper in all; and, furthermore, that syrups clarified with such filter papers by the pulp method have been found to be contaminated with “traces of metallic impurity” (copper). Not only is the presence of this metal objectionable in analytical operations, but the metallic impurity derived from this source may be sufficient in the case of syrups used for sweetening lemonades to make the use of paper pulp for their clarification quite objectionable also.—Pharm. Journ., May 23, 1908, 692.

*Adjustable Tenakel—Convenient Construction.*—L. Morgenstern (Bühlau), has devised and supplies adjustable frames (tenakel) for the recep-

FIG. 14.

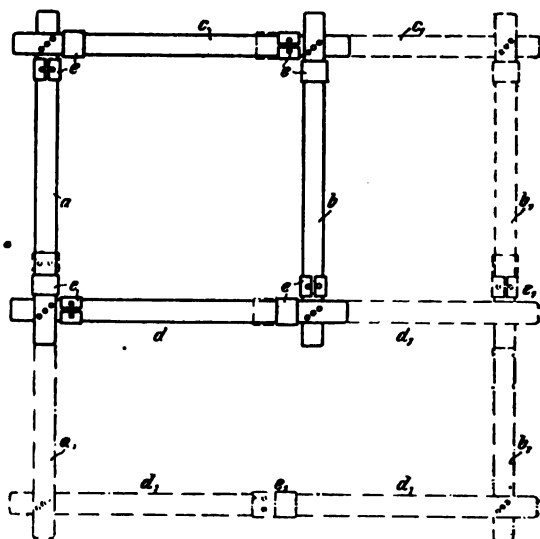
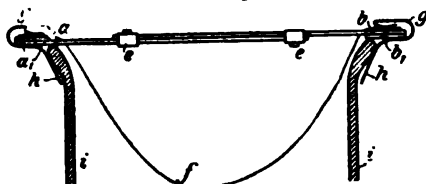


FIG. 15.



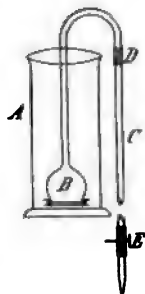
Adjustable Tenakel.

tion of strainers of different dimensions. The adjustment is effected by slides, as shown in the accompanying drawings Figs. 14 and 15. The

strainer is fastened to the frame, not by nails as is customary, but by means of spring-clamps, shown at *a*, *g*, and *b*, *g*, fig. 15.—Pharm. Ztg., liii (1908), No. 48, 478.

*Precipitates—Washing with a Syphon Filter.*—Wefers Bettinck recommends the syphon filter, shown in Fig. 16, for washing bulky precipitates. The outfit consists of a tall cylindrical glass jar *A*, and an inverted funnel-tube *B*, the stem of which is bent and connected at *D* with the glass tube *C*, which in turn is provided below with a valve-clip *E*. The funnel opening *B* is tied over with toughened filter paper, or with ordinary filter paper fortified by cotton-gauze. The operation is started by suction at *E* and continues uninterruptedly so long as wash liquid is supplied to the jar *A*.—Pharm. Ztg., liii (1908), No. 48, 479; from Pharm. Weekbl., 1908, No. 21.

FIG. 16.



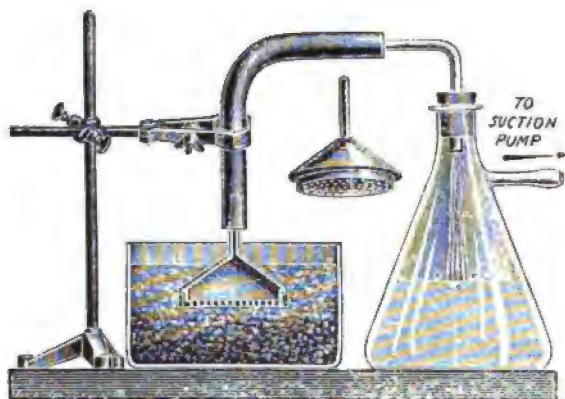
Syphon-Filter.

*Filtration and Extraction of Fine Precipitates—Intervention of Pulped Paper.*—E. Bornemann recommends the establishment of a filter-medium that will prevent the penetration of fine precipitates by first running pure pulped filter paper, suspended in water, into the filter, so that the latter may be coated with a layer of the pulp. If then a second coating is applied in the same way, the filter will retain the most infractionous precipitate, such for example, as barium sulphate, even when this has been precipitated at the ordinary temperature. Using for this purpose a good quality of filter paper, it is not necessary to wait for the settling of the precipitate. In some cases it is advantageous also to mix a portion of the pulped paper with the liquid containing the precipitate; and, again, the pulp may be so added if it has been found that the precipitate is not retained by the ordinary filter used. In all cases the rate of filtration will be retarded somewhat, but this is compensated by securing an absolutely clear filtrate. If precipitates are to be removed from non-aqueous fluids, for example from benzol solutions, the pulp filter may be established as initially described, the water displaced by alcohol, and this by benzol, etc.—Pharm. Ztg., liii (1908), No. 30, 300; from Chem. Ztg., 1908, No. 21.

*Suction Filter for Precipitates—Efficient Construction.*—E. Blümner recommends the device illustrated by Fig. 17, for the rapid filtration of liquids from the precipitates resulting in reacting mixtures. It consists of a reversed filter, the construction of which is plainly evident in the drawing, which is lowered into the liquid containing the precipitate, but may be raised as required to wash off accumulations of precipitate with a spritz-bottle when they interfere with the filtration, without interrupting the action of the suction pump. The filtrate is collected in a suitable vessel, which in turn is connected with the suction pump. The apparatus for laboratory

use, constructed of glazed porcelain with a sieve-bottom for the reception of an 8-Cm. filter, is supplied by Heinrich Göckel, Berlin.—Pharm. Ztg., liii (1908), No. 22, 220.

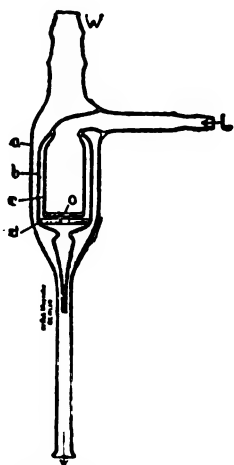
FIG. 17.



Suction Filter.

*Water Suction Pump—Improved Construction.*—Dr. Robert Muencke

FIG. 18.



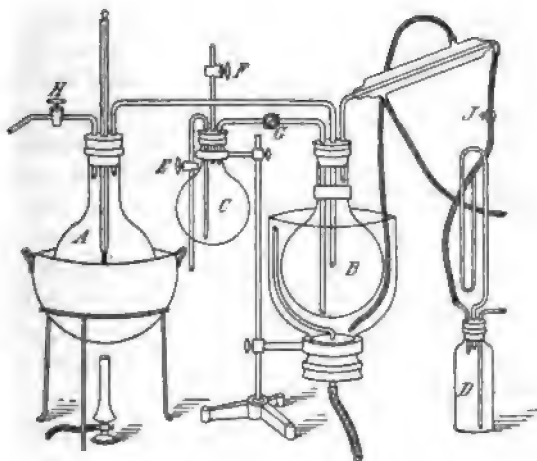
Water-Suction Pump.

(Berlin) constructs a new form of water-suction pump, in which the reflux of water is prevented by means of an automatic valve. The new device is illustrated by the accompanying cut (Fig. 18), and explained as follows: The water admitted at (*w*), in its passage between (*a*) and (*b*), causes suction from the interior of the double-walled bulbous extension (*c*) of the tube (*L*), leading to the vessel in which a vacuum is to be produced. The inner wall or bulb of this extension is perfectly flat on the bottom, which is provided with a central hole (*o*), and ground on the outer surface, a ground-plate (*d*) being interposed between the bottom of this inner bulb and the outlet of the outer bulb. The interposition of the ground-glass plate (*d*) closes the opening (*o*), when the suction is intercepted, thus preventing the reflux of water into the interior vessel, and opens automatically when suction is resumed.—Apoth. Ztg., xxiii (1908), No. 47, 419; from Chem. Ztg., 1908, 542.

*Apparatus for Vacuum Distillation—Practical and Economical Construction.*—J. Oudenampsen describes an apparatus for vacuum distillation the details of which are illustrated by Fig. 19. The balloon-flask *A*, of about 2 l. capacity and containing a capillary tube to secure equable boil-

ing, is connected with the flask *B*, of the same shape and capacity, as shown in the drawing; *B* again is connected on the one hand with a reflux condenser, on the other with the flask *C*, while, in turn, *C* is provided with the syphon-tube *E* and the cock-tube *F*. The condenser is connected with the flask *D*, which is provided with a close manometer and a tube for connection with the air pump. Flask *A* is surrounded by a hot-water bath; flask *B* by a cold-water bath, which is supplied from the overflow of the Liebig's condenser and kept at a constant level by the properly elevated waste-pipe. In use the cocks *H* and *G* are closed and the air-pump is started; the tube carrying the cock *H* is introduced into

FIG. 19.



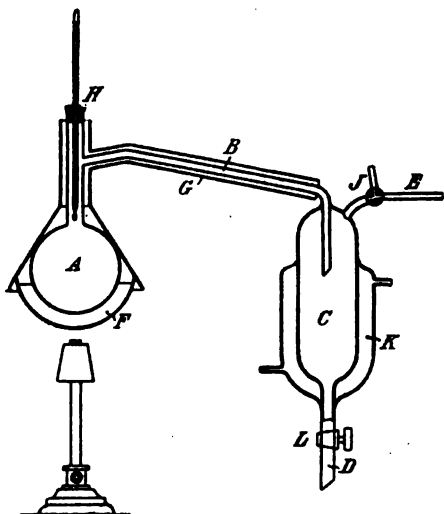
Apparatus for Vacuum Distillation.

the liquid to be distilled, and the cock *H* being then opened, the distillation proceeds, the distillate collecting in *B*. When it becomes desirable to remove the accumulated distillate, the cocks *F* and *E* are closed and the cock *G* is *carefully* opened; whereupon the air in *C* is uniformly distributed throughout the apparatus, and if the cock *H* is now *carefully* opened, the distillate from *B* syphons into *C*. When this has been effected, cock *G* is again closed, and the vacuum having been re-established, distillation proceeds as before. The distillate collected in *C* is then syphoned into suitable containers by opening cocks *E* and *F* and blowing through the latter.—Pharm. Ztg., liii (1908), No. 7, 67; from Pharm. Weekbl., 1907, No. 47.

*Apparatus for Distillations in a High Vacuum—Simplified Construction.*—H. Bueler de Florin describes the apparatus illustrated by Fig. 20, which is intended for distillations in a high vacuum, and has the merit of great simplicity over the apparatus of Oudenampsen, described in the pre-

ceding abstract. The connection of the boiling-flask *A* and the receiver *C* by means of the cooling-tube *B* is effected without the use of cork or rubber tubing. The flask is heated by the air bath *F*; the covering *G* of

FIG. 20.



**Apparatus for Distillations in a High Vacuum.**

the cooling-tube may be composed of asbestos or wire-netting. The space *K* surrounding the receiver *C* is particularly serviceable in the case of solidified products of distillation, which may be liquefied by admitting hot water or steam, and then removed by opening the glass cock *L* in the tube *D* after having restored normal atmospheric pressure in the apparatus by means of the three-way cock *I* in the tube *E* leading to the exhaust pump. In fractional distillations the fractions are removed as required in the same way, and, the cock *L* being again closed and the three-way cock adjusted to the exhaust, distillation may be resumed.—Pharm. Ztg., liii (1908), No. 12, 121; from Chem. Ztg., 1908, No. 5.

**Condenser—New Form.**—J. T. Davidson has described and recommends the new form of condenser shown by Fig. 21, which is so well described in the illustration that it requires little explanation. According to the purpose, the number of condensing units, consisting of a flattened, circular, hollow disk six inches in transverse diameter, may be increased or diminished; or a battery of two or more such condensers may be employed for larger operations. A condenser in use by the author is composed of a series of four of the disks of the dimensions mentioned, united by one-inch apertures. These are contained in a tank 12 inches deep by 9 inches wide—the whole apparatus being composed of galvanized iron.—Merck's Rep., Nov., 1907, 315.

**Reflux Condenser—A New Form.**—Dr. Edward Merkel has designed the new and more compact form of reflux condenser, Fig. 22, which possesses the advantage over the usual form of ball-condenser, that it is not top-heavy, can readily be held in place by means of a cork ring or fitted by grinding into the orifice of the extractor, and, by permitting the ball-condensing tube to extend some distance upward, increases the condensing



efficiency and thus prevents loss of solvent.—Apoth. Ztg., xxiii (1908), No. 52, 469; from Ztschr. f. angew. Chem., 1908, 976.

FIG. 21.

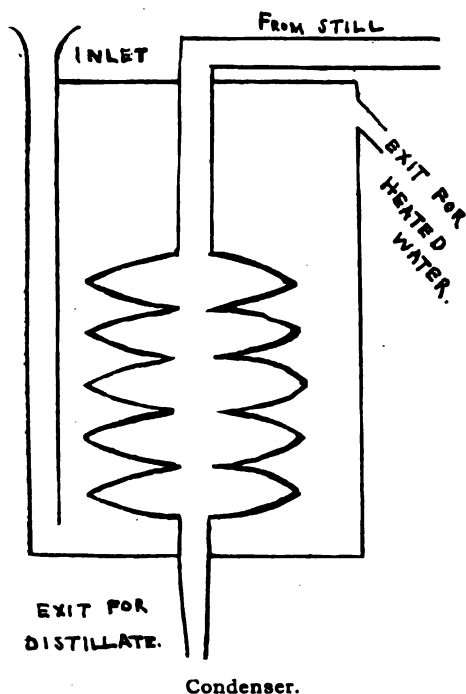
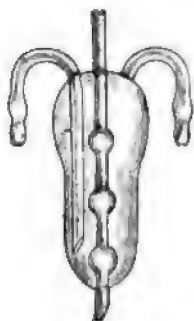
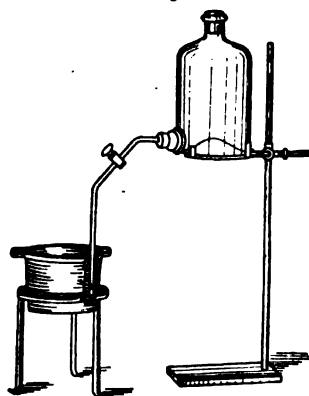


FIG. 22.



Reflux Condenser.

FIG. 23.



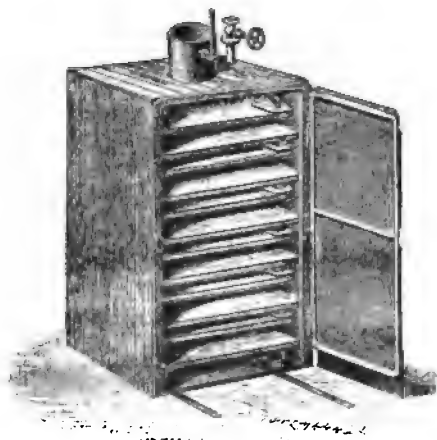
Constant-Level Water-Bath.

*Constant-Level Water-Bath—Simple Construction.*—H. Leiser suggests the very simple construction of a constant-level water-bath, illustrated by Fig. 23, which consists in providing the water-supply tube, reaching into the water-bath, with a lateral opening at a suitable height. The water is supplied from a tubulated bottle, from which the stoppered supply-tube descends into the bath. This supply-bottle, having been filled with water, is securely corked and the cock in the supply-tube opened, whereupon water is admitted into the bath until the lateral opening in the supply-tube is covered by it. It is then supplied automatically as fast as it is evaporated until the supply is exhausted—the latter, of course, being replenished from time to time as needed. This arrangement has the further advantage, however, that the hot air replacing the water in the supply-bottle is mixed with steam, and that consequently the water-supply

is thus preliminarily heated—under circumstances up to  $70^{\circ}$ – $80^{\circ}$  C.—before it reaches the bath.—Pharm. Ztg., lii (1907), No. 66, 689; from Ztschr. f. angew. Chem., 1907, No. 28.

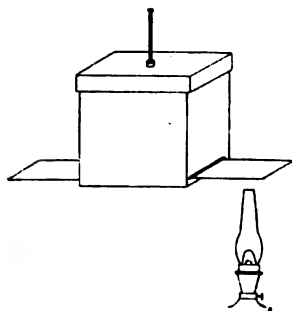
*Drying Closet—Improved Construction.*—Friedr. Heckmann (Berlin) has devised and supplies a drying closet of improved construction, which is illustrated by Fig. 24. It is constructed of iron or copper, protected by a wooden mantle from loss of heat, and is provided with double-walled shelves of the same metal, which are heated by steam circulating through them. The effectiveness of this closet is materially increased by systematic provision for the circulation of air, and insures the rapid drying of the material placed upon the shelves in suitable trays. The wooden mantle is provided with rollers so that, if desirable, the closet may be drawn out

FIG. 24.



Drying Closet.

FIG. 25.



Simple Thermostat.

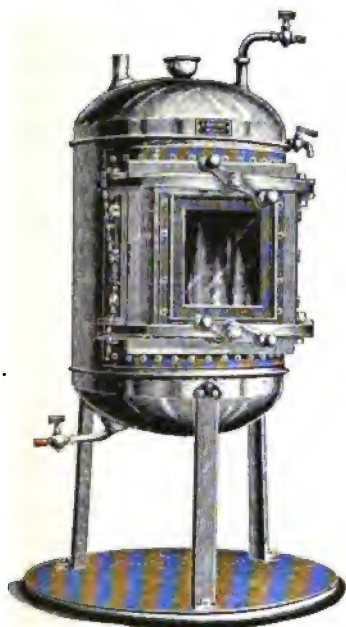
from its assigned position for the purposes of inspection, etc.—Pharm. Ztg., lii (1907), No. 56, 584.

*Simple Thermostat—Cheap Construction.*—A. Sineff simply and economically constructs a thermostat from a strong pasteboard box by making two horizontal slits on opposite sides a short distance above the bottom and inserting a strip of sheet-iron, as shown by Fig. 25. A thermometer being inserted through the lid, heat is applied with a lamp to one of the protruding ends of the sheet-iron strip. Temperatures may thus be accurately maintained within a limit of  $0.5^{\circ}$  C.—Pharm. Ztg., lii (1907), No. 99, 1031; from C.-Bl. f. Bakter., 1907, 45, No. 2.

*Vacuum Closet—New Form.*—Dr. Fritz Haufland describes a new form of vacuum closet for laboratory operations (shown by Fig. 26), which, being double-walled, may be heated by hot water produced with the gas.

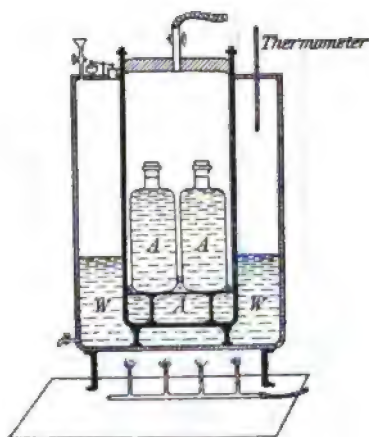
flame, or by connecting the mantle with the steam supply. In the former case the pressure corresponding to the required temperature above  $100^{\circ}$  may be automatically secured by means of a mercury pressure-regulator. The door of this closet fits absolutely tight and is held in place by means of two steel stirrups and steel winches, which permit bodily removal or application of the door to the opening with convenience and rapidity.

FIG. 26.



Vacuum Closet.

FIG. 27.



Double Autoclave.

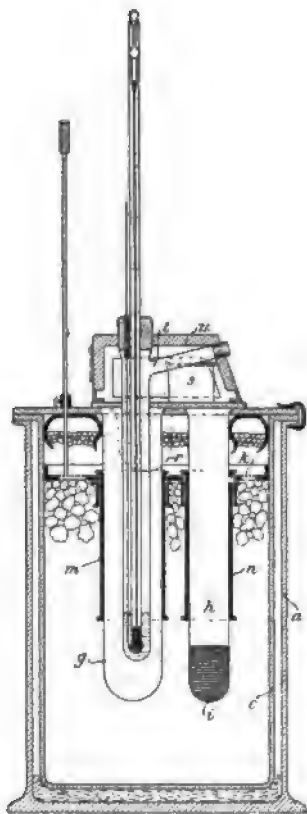
The dimensions of the door-opening in the apparatus here shown are 18 Cm. in width by 20 Cm. in height, from which the size of the apparatus ordinarily in use may be calculated; but larger apparatus of the same construction are also supplied by the manufacturer. Apoth. Ztg., xxii (1907), No. 69, 731.

*Double Autoclave—Construction for Sterilizing Liquids Lighter than Water.*—Triolett and Bertaut recommend a double autoclave for the sterilization of alcoholic and other liquids lighter than water, the construction of which is shown by Fig. 27. It consists of an autoclave, *W*, containing water, into which a second autoclave, *A*, containing alcohol, is fitted. This is provided with a perforated shelf, upon which the vessels containing the alcoholic liquid to be sterilized is placed. For an inner autoclave of 10 liters capacity not more than 100 Gm. of alcohol are required. A partial vacuum is thus established in the inner autoclave, and it is heated by the

application of flame to the outer autoclave for about 40 minutes at  $120^{\circ}\text{C}$ . Sterilization is thus effected without danger of loss by evaporation of the liquid under treatment, since the containers are surrounded by the vapor of the same liquid under the same pressure. The liquid in the inner autoclave must in all cases be the same as that in the solutions to be sterilized. —Pharm. Ztg., lii (1907), No. 99, 1535; from Bull. des sc. pharm., 1907, No. 10.

*Kryoscope—Improved Construction.*—Dr. M. C. Dekhuizen has patented an improved apparatus for determining freezing-points (shown by Fig. 28), in which some of the faults of Beckmann's kryoscope are avoided, and which is claimed to yield very accurate results.

FIG. 28.



Kryoscope.

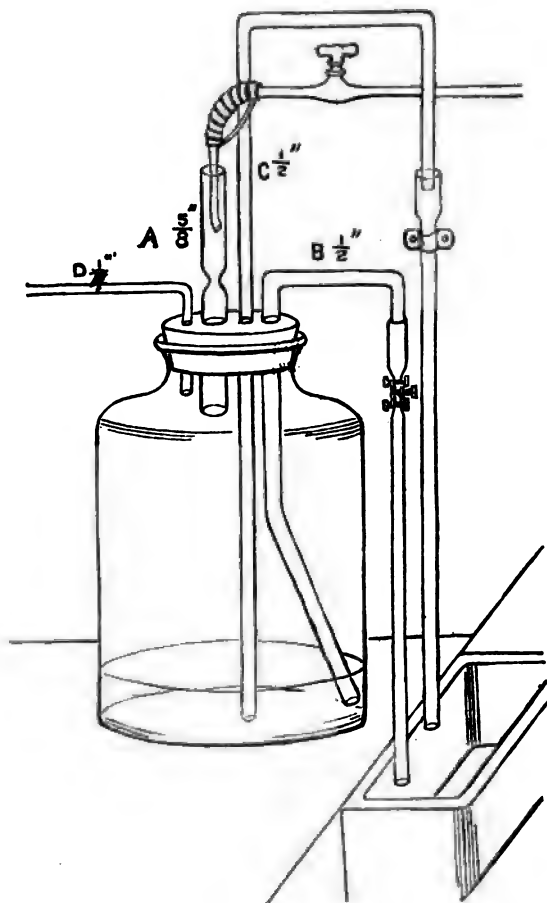
A quick cooler of special construction permits the rapid reduction to the expected freezing-point, and the application of a peculiar stirring arrangement, which makes it possible to use a freezing mixture of ice and solution of salt, are the most essential improvements effected in this new kryoscope; and in addition, the usual air-cooling vessel, *g*, is supplemented by a second vessel, *h*, which is partly filled with mercury, *i*. The upper part of the freezing tube, *g*, with the extension, *t*, is enclosed in a chamber *u*, containing the refrigerating agent, *s*; this chamber, *u*, being so attached to the vessel *a* and *c*, containing the refrigerating bath, that it may be readily removed. The stirring arrangement for the cooling bath, composed of a close-meshed web, *k*, acts by sliding up and down along the metal cylinders *m* and *n* surrounding the freezing tubes *g* and *h*.—Pharm. Ztg., liii (1908), No. 22, 220.

*Water-Jet Blower—Simple and Inexpensive Construction.*—S. M. Revington and I. G. Rankin find the blowing apparatus at present generally used, consisting of a copper cylinder with metal filter-pump attachment, gauges, etc., to be not only costly, but far from excellent in efficiency.

They describe the apparatus shown by Fig. 29, which is both efficient and inexpensive, and is constructed as follows: A large bottle, say of 4 liters capacity, is fitted with a good cork pierced with holes for four tubes

whose diameter are: (*A*)  $\frac{5}{8}$ , (*B*)  $\frac{1}{2}$ , (*C*)  $\frac{3}{8}$ , and (*D*)  $\frac{1}{4}$  inch. The tube *A* has a somewhat sudden constriction made in it. Into the upper end of this tube the jet delivers in such way that it goes diagonally across the tube on the side of the constricted part—this direction giving the best results, and it is this modification of the usual filter pump that has rendered

FIG. 29.



Water-Jet Blower.

the blower really efficient. The tube *B* is a syphon outlet consisting of a wide bent tube passing to the bottom of the bottle and connected at the other end to a similar bore tube discharging into the sink—a clip being attached to the rubber connecting tube to regulate the outfall. The tube *C* is a safety tube, not quite reaching the bottom of the bottle and about 2 feet 6 inches in height, bending at the top so as to discharge into a wide

tube leading to the sink. Air passes out of the tube *D*, which just passes below the cork.

When water is turned on and the air exit kept closed, as may be done by a blowpipe with air control, the pressure first starts the syphon, and afterwards air and water escape by the safety, so that the pressure quickly reaches a maximum. On now releasing the blast it will be found sufficient for the full gas and to work very steadily; it is far superior for use with a small blowpipe to blowing with the mouth in the case of joining up long pieces of apparatus, while a platinum crucible can be kept white hot for any length of time. Chem. News, Nov. 29, 1907, 259-60.

*Sublimation—Simple Apparatus for Small Quantities.*—W. G. Llewellyn finds that the purification of a substance by sublimation is very easily and rapidly accomplished by means of a simple apparatus constructed of two test-tubes. An open tube, conveniently made from a large test-tube by cutting the closed end off, and about  $5\frac{1}{2}$  inches long, is fitted closely into a 6-inch test-tube, into which the substance to be sublimed is placed, a plug of glass wool being loosely fitted into the open end to prevent the escape of vapor. The substance is thus condensed on the inner (open) tube, from which it may be removed by scraping, free from any charred residue, which is retained in the outer test-tube.—Chem. News, April 24, 1908, 198.

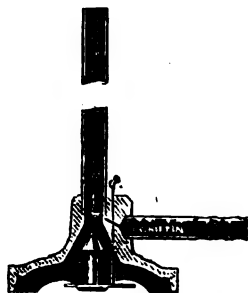
*Melting-Point Thermometer—Convenient Construction.*—Gustav Müller

FIG. 30.



Melting-Point Thermometer.

FIG. 31.



Bunsen Burner.

FIG. 32.



Evaporating Dish.

(Ilmenau) has devised and supplies a convenient form of thermometer for melting-point determinations, which is illustrated by Fig. 30. The mer-

cury bulb, *Q*, is surrounded by a cup, *N*, for the reception of the melting-point tubes, *S*, which it will accommodate to the number of three or five. To facilitate the rapid entrance of the heated liquid into the cup with avoidance of air-bubbles, and to subsequently empty and cleanse the same, the bottom of the cup is perforated with two or more holes, *L*.—*Pharm. Ztg.*, lii (1907), No. 56, 583; from *Chem. Ztg.*, 1907, No. 45.

*Bunsen Burner—New Modification.*—The London firm of John J. Griffin has introduced a new Bunsen burner (shown by Fig. 31), in which the air inlets are at the base of the stand—not at the foot of the burner tube; nor is there a jet in the burner, so that there is no possibility of the flame lighting back. The amount of air is regulated by a movable cone, shown in the section. This is moved up and down by means of a double wire, and enables the production of a luminous flame, an ordinary Bunsen flame or a Tecu blast flame, as required. The burner gives a wide range of temperature.—*Chem. & Drugg.*, Oct. 19, 1907, 611.

*Evaporating Dishes—A New Form with Base.*—Hermann Steinbuch (Vienna) supplies a new form of enameled evaporating dishes, in different sizes, which are provided with a base (as shown by Fig. 32), so that they will rest securely on a table when removed from the water or steam bath without the necessity of the customary ring-support. They are described as thin-walled, light and durable, white on the inner, blue on the outer side.—*Apoth. Ztg.*, xxiii (1908), No. 39, 352; from *Vierteljahrschr. f. prakt. Pharm.*, 1908, 68.

*Platinum Crucibles—Cause of Instability.*—G. Siebert having attributed the destruction of platinum crucibles exclusively to the inherent quality of the metal (see *Proceedings* 1905, 514), C. Heraeus now positively disputes this view, inasmuch as his experiments conclusively show that the destruction of the crucible is in most cases the result of injudicious manipulation. His experiments have furthermore determined that the exposure of platinum vessels to the upper part of the flame, which is usually considered as being unattended by danger to the metal, may also become destructive, owing to the attack of the products of reduction generated by the diffundating hydrogen. In such cases, electric heat is preferable to heating in the flame. These observations, of course, do not serve to explain all the causes that are responsible for rendering platinum utensils brittle; but they point out a factor which cannot be ignored, and particularly not when such utensils are exposed to prolonged red heat.—*Pharm. Ztg.*, lii (1907), No. 90, 941; from *Ztschr. f. angew. Chem.*, 1907, No. 44.

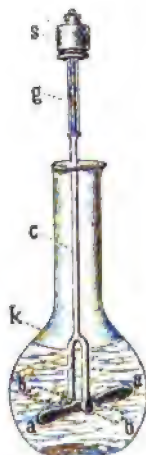
*Stirrer for Narrow-Necked Vessels—A Practical Device.*—Gustav Müller (Ilmenau) has devised and supplies a practical stirrer intended for narrow-necked vessels, which is illustrated by Figs. 33 and 34. The stirring-rod is forked at the end and carries a double blade, the two limbs

of which are of unequal length, so that when at rest, as shown by Fig. 33, the blade occupies a vertical position and is easily introduced and again

FIG. 33.



FIG. 34.



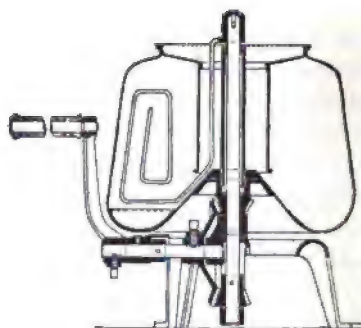
#### Practical Stirrers.

removed from the vessel; but as soon as the stirring-rod is rotated, the double-blade assumes a horizontal position, as shown by Fig. 34, and effective stirring of the contents results—the unequal length of the two

FIG. 35.



FIG. 36.



#### Universal Mixing Machine.

arms imparting to the rotating blades also a vertical, up- and down-motion, as indicated by the dotted lines.—Pharm. Ztg., lii (1907), No. 56, 583; from Chem. Ztg., 1907, No. 46.

*Universal Mixing Machine—A Convenient Apparatus for Emulsions,*



*Ointments and Powder Mixtures.*—August Lemsch (Wiesbaden) supplies the "Universal Mixing Machine, shown by Figs. 35 and 36, which serves not alone for efficiently preparing emulsions, but also for the convenient preparation of ointments and powder mixtures. As shown in section (Fig. 36) the apparatus consists of a tinned iron vessel of peculiar shape, which is provided with a mechanical stirrer so constructed that the two wings composing it will revolve in opposite directions on turning the winch. This effects rapid and complete admixture of the contents of the vessel with a minimum of exertion, while in the case of ointments the peculiar shape of the mixing vessel permits the application of heat by a direct gas or alcohol flame.—Pharm. Ztg., liii (1908), No. 7, 66.

*Flask Supports—Simple and Economical Forms.*—Ludwig Zeiler constructs various practical and economical forms of flask supports illustrated by Figs. 37, 38 and 39, which have the advantage of being expansible and springy or elastic, so that they may serve for the support of flasks of differ-

FIG. 37.



FIG. 38.

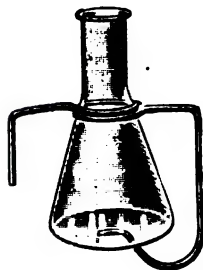


FIG. 39.



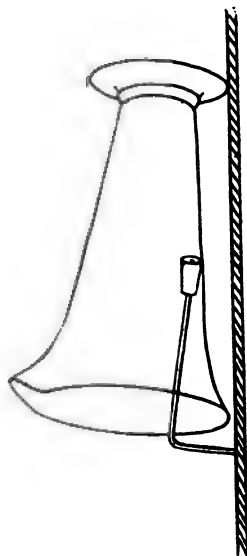
Flask Supports.

ent shapes and sizes. The form shown by Fig. 37 consists of a curved spring clamp, suitable for supporting boiling flasks; Fig. 38 shows a wire support for flasks, whereby they may be suspended and held securely in an upright position in a water-bath; while in Fig. 39 the support is supplied with a tripod-like extension upon which the flask may rest securely in and after its removal from the bath.—Pharm. Ztg., lii (1907), No. 66, 690.

*Graduate Holder—Simple Device.*—A. H. Bosworth suggests a convenient holder for graduates (Fig. 40) which is simply constructed as follows: Insert a long nail (or heavy, springy wire, according to required

size) through a cork lengthwise, and drive it into a board fixed against the wall above the sink, far enough to hold firmly: then, pushing the cork to the head of the nail (or wire), bend the latter at right angles a short distance from the board. The cork serves to protect the graduate, which is firmly held in place, from breaking.—Bull. Pharm., Aug. 1907, 336.

FIG. 40.



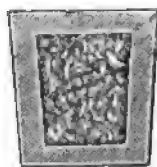
Graduate Holder.

FIG. 41.



Rubber Tubing.

FIG. 42.



Rubber Stoppers.

*Rubber Tubing—Simple Contrivance for Suspension when not in Use.*—Carl Junghaus has secured a German patent for the simple, saddle-shaped contrivance (see Fig. 41) for the convenient preservation and suspension of rubber tubing when not in use. The practical utility of this invention is self-evident, and requires no further commendation.—Pharm. Ztg., liii (1908), No. 39, 391.

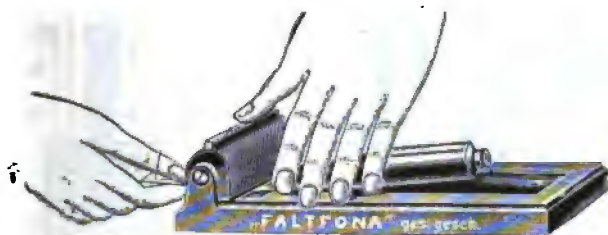
*Rubber Stoppers—Economical Form with Asbestos Filling.*—A cheap form of rubber stoppers is now manufactured under a German patent by the introduction of asbestos in the interior, as illustrated by the accompanying cut (Fig. 42). These stoppers are claimed to be quite as resistant and equally serviceable as are the solid rubber stoppers ordinarily used for closing the containers of drugs, chemicals and liquids of various kinds.—Pharm. Ztg., lii (1907), No. 90, 942.

*Rubber Articles—Preserving Liquids.*—J. Larine makes some practical suggestions concerning the preservation of rubber articles in various liquids. Immersion in a 3 per cent. aqueous solution of phenol is found to be the best means of keeping rubber tubes, sounds, etc., flexible and

elastic, the only precaution necessary being that the articles should lie straight in the liquid without folds or bends. Rubber articles may thus be kept in perfect condition for years. An aqueous solution of aniline of the same strength may also be used, but it causes a slight increase of length and volume of the rubber, and is not so handy in hospital practice as phenol. Solutions containing glycerin or alcohol have only a slight action in restoring elasticity to old articles; new ones keep fairly well in these solutions. Maceration in a 1 per cent. solution of sulphurated potash perfectly restores the elasticity of old rubber, both red and black. Its odor is, however, very objectionable. Lime water, which has been employed for the purpose, is not recommended, as it is both troublesome and inefficacious.—Pharm. Journ., April 18, 1908, 518; from *Pharmsvet. J.*, 1907, 403, through *Journ. de Pharm. et Chim.*, 26 (1907), 225.

*Collapsible Tube Filler—A Convenient Device for the Prescription Counter.*—The collapsible tube-filler, "Faltfona," shown by Fig. 43, is a

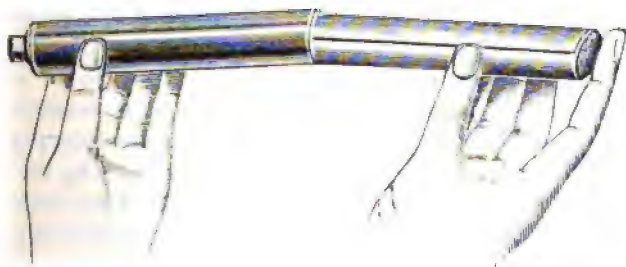
FIG. 43.



Collapsible Tube Filler.

German device intended for conveniently dispensing prescriptions for ointments or pastes, with cleanliness and dispatch. It is operated as follows: The amount of ointment, etc., required to fill the tube is spread on

FIG. 44.



Collapsible Tube Filler.

a strip of parchment paper of suitable width and about 4 Cm. longer than the tube, and then rolled up so as to form an even roll, which is inserted into the tube as illustrated by Fig. 44. The tube is then placed under the

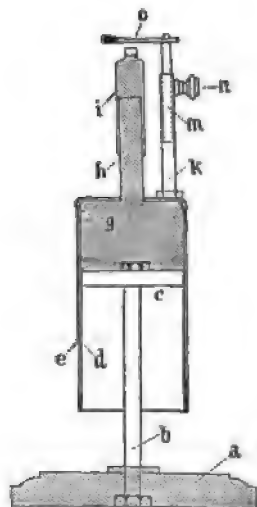
unclamped shaft of the apparatus with the open end protruding. The clamp is then applied with sufficient pressure to enable the withdrawal of the paper, the ointment being retained in the tube, the open end of which may then be folded after applying the full pressure of the clamp. The operation, properly conducted, assures cleanliness in every respect.—Apoth. Ztg., xxii (1907), No. 101, 1107.

*Tube-Filler—A Simple Form.*—Paul Leitzen has devised the tube-filling apparatus, illustrated by Figs. 45 and 46, which differs from the tube-filler of the usual design in that the piston is immovable while the filling-cylinder slides up and down as required. The details are clearly shown by Fig. 46. The piston (*c*) supported by the rod (*b*) is firmly attached to the polished wooden base (*a*) and is fitted snugly into the cylinder (*d*) covered with the mantle (*e*); the salve or paste to be filled,

FIG. 45.



FIG. 46.



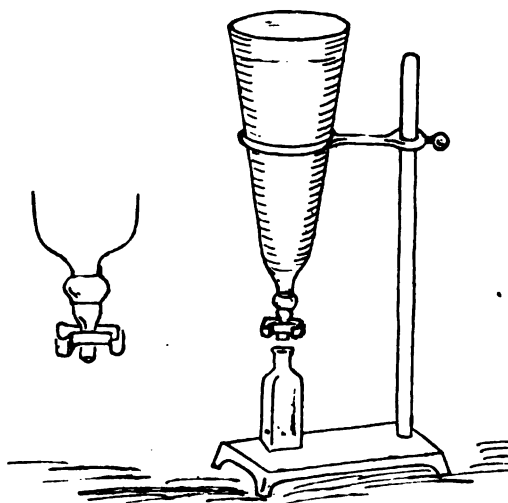
Tube-Fillers.

being placed in the cylinder, the cover (*g*) is fastened on and by simple pressure downward, delivers the salve through the outlet-tube (*h*) into the collapsible tube (*i*)—the latter being held in position by the movable plate (*o*). The outflow of salve is regulated by the rod (*m*), sliding in the socket (*k*), the adjustment being effected by means of the set-screw (*n*). The apparatus is supplied with interchangeable covers, as shown in Fig. 45: the one mounted, fitting collapsible tubes of 25 Mm., the other, shown alongside, of 19 Mm. diameter.—Apoth. Ztg., xxiii (1908), No. 45, 399; from Vierteljahrschr. f. prakt. Pharm., 1908, 80.

*Bottle Filler—An Efficient Device for Thick Liquids*—Elmer W. Rice

has used the device illustrated by Fig. 47 with satisfaction for filling toilet preparations, such as have a tragacanth base for example, and other thick-flowing liquids into small bottles. It consists simply in attaching an ordinary rubber nipple, having the hole trimmed larger, to the nozzle of a

FIG. 47.



Bottle-Filler.

percolator of convenient size, fastening it by means of fine wire, and closing it by means of a pinchcock. The illustration makes further explanation unnecessary.—*Bull. Pharm.*, April 1908, 164.

*"Ampulles," (Sealed Tubes).—Quality of Glass Important.*—Ludwig Kroeber comprehensively discusses the modern application of sealed-glass tubes, the so-called "ampulles," for the preservation of sterilized injection solutions, etc., in the course of which he calls attention to various conditions that may fail to render them as effective as they are expected to be for this purpose. This he finds chiefly due to the quality of the glass. Among the large number of examinations made by the author, with the single exception of a sample of Bohemian tubing, only the tubes made of "Jena" normal glass (16. iii) proved to be suitable for making the "ampulles." All other glasses contained soluble alkali. But in any case, the author considers it important that the glass, whatever its source, should be carefully tested before filling and sealing the tubes.—*Apoth. Ztg.* xxiii (1908), No. 51, 458–460.

*Brown Glass Bottles—Spontaneous Fractures.*—Max Saur calls attention to the spontaneous fracture of brown glass bottles containing solution of chlorinated soda, both when stored in a cool cellar, and when kept in the laboratory under proper precautions, while this fatality was not experi-

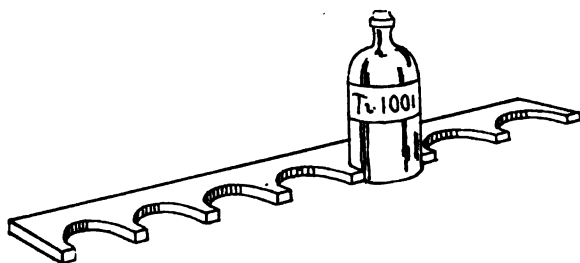
enced, under identical conditions, when the containers were of green glass. Fissures, scarce visible, at first manifested themselves, without leakage, but culminating essentially in the complete fracture of the bottle into splinters.—*Pharm. Ztg.*, lii (1907), No. 91, 954.

Similar observations concerning the containers of solution of chlorinated soda have been made by Fr. Kunze, Dr. Klut and E. Radant. Kunze and Radant, however, have found that

*White (Flint ? Rep.) Glass Bottles* are liable to spontaneous fracture also when used as containers for chlorinated soda solution, while Dr. Klut confirms the observation that green glass containers are not liable to spontaneous fracture under the condition mentioned. This liability to fracture in the presence of sodium hypochlorite is probably due to the composition of the glass, that of green glass rendering it immune to the action of the hypochlorite.\*—*Ibid.*, No. 93, 972.

*Shelf Bottles—How to Keep in Place.*—J. F. Shores recommends the simple device shown by Fig. 48 for keeping shelf bottles in place, which, while not new, may serve as a reminder. It is easily made by placing the

FIG. 48.



Shelf Bottle Holder.

bottles in proper order on a (thin?) board, drawing one-half the circumference of each with a pencil, and then sawing out the semicircle, as illustrated, with a key-hole saw. The form is then tacked on the shelf.—*Bull. Pharm.*, Dec., 1907, 513.

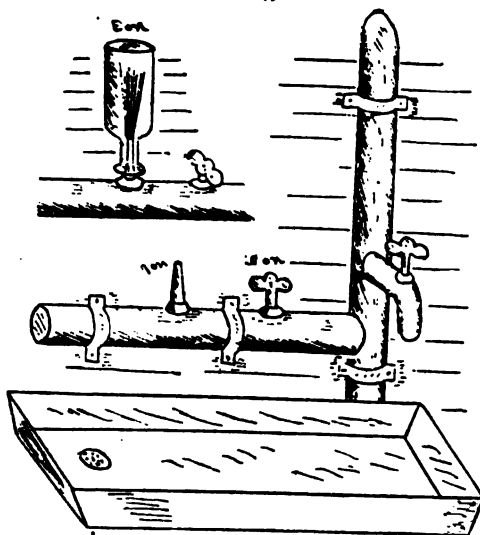
*Bottle Washer—Economical Construction.*—L. W. Marshall describes the very convenient arrangement for washing bottles, shown by Fig. 49, which may be constructed as follows: Solder the nozzle of a metal syringe (No. 1), to a short piece of lead pipe extending at right angles from the main water-pipe, closed at the end and having a tap (No. 2), interposed between the nozzle and water supply. The application is shown by No. 3 of the drawing.—*Meyer Bros. Drugg.*, April, 1908, 102.

---

\* Mr. Leo Eliel has also called attention to the liability of glass shop-bottles to spontaneous fracture when they serve as containers of certain liquids (see *Proceedings*, 1907, 6-8), though remaining intact in the presence of other liquids.

*Cosmetic Mold—Simple and Inexpensive Device.*—Luther Marshall makes a handy mold for cosmetic sticks by rolling pieces of wax or oil

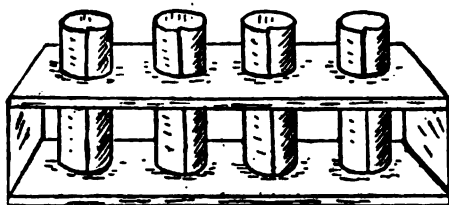
FIG. 49.



Bottle Washer.

paper of suitable size on a round stick and crimping it at one end. The paper molds are then placed in a rack, as shown by Fig. 50, which is easily constructed (from cigar-box boards, Rep.), and filled with the

FIG. 50.



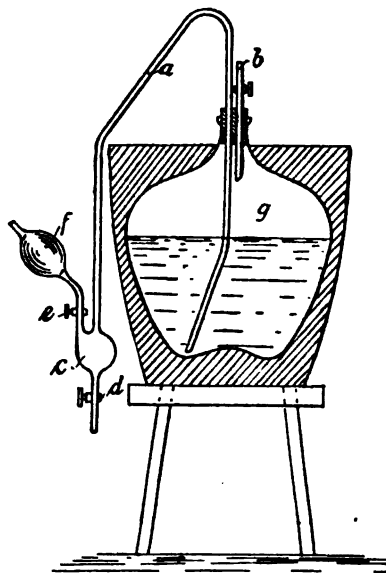
Cosmetic Mold.

melted cosmetic, leaving a space at the top for crimping the paper. They are then wrapped in foil and labeled.—Bull. Pharm., Jan., 1908, 30.

*Acid Syphon—Efficient Form for Carboys.*—Theo. Grzeschik has devised the syphon illustrated by Fig. 51, for conveniently withdrawing acids from carboys, which requires little description. The syphon tube, *a*, reaches the interior of the carboy through one of the perforations in the stopper, a second perforation bearing an air-tube provided with a stop-cock, *b*. The outer extension of the syphon is expanded into a bulb, *c*, ending in an outlet bearing a stop-cock, *d*, and provided with a lateral extension up-

wards, ending in a rubber suction-bulb, *f*, an air-cock, *e*, intervening. In use the stop-cock, *d*, is closed, the air-cock, *e*, opened, and the air is

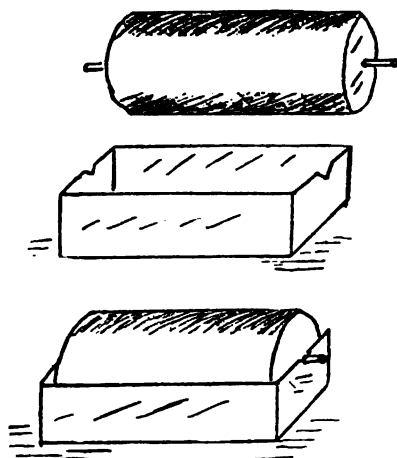
FIG. 51.



Acid Syphon.

withdrawn by means of the suction-bulb, *f*, until the bulb, *e*, is filled with the acid. The air-cock, *e*, is now closed and the cock, *d*, opened, where-

FIG. 52.



Label-Moistener.

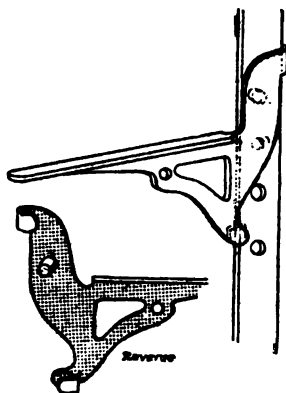
upon the acid is delivered uninterruptedly, the necessary air being admitted through the air-tube, *b*.—Apoth. Ztg., xxii (1907), No. 66, 687.



*Label Moistener—A Simple Home-Made Device.*—L. W. Marshall describes a home-made label moistener, which is illustrated by Fig. 52. A flat tin box of convenient size, one that will hold water, is notched at both ends. Then make a wooden cylinder just long enough to fit in the box; drive a nail in each end and set it in the notches, so it can be turned as required. Fill the box about one-third full of water. To moisten a label turn the cylinder so that its wet surface will come uppermost and then apply the label to the surface.—*Drugg. Circ.*, Dec., 1907, 764.

*Window Shelves—Self-adjusting Bracket.*—A new adjustable bracket for glass window shelves has been devised and is supplied by the Liverpool firm of Ayrton-Graham. As will be observed from the sketch (Fig. 53), the bracket has a stud which slips into one of the four holes in an adjustable support that fixes upon the frame attached to the window. Adjust-

FIG. 53.



Bracket for Window Shelves.

ment is effected without the use of any screws or other loose parts, and the invention enables the window-dressers to remove the shelves, adjust the brackets, and refix in the shortest time, everything being quite as secure and safe as the ordinary style.—*Chem. & Drugg.*, Feb. 15, 1908, 258.

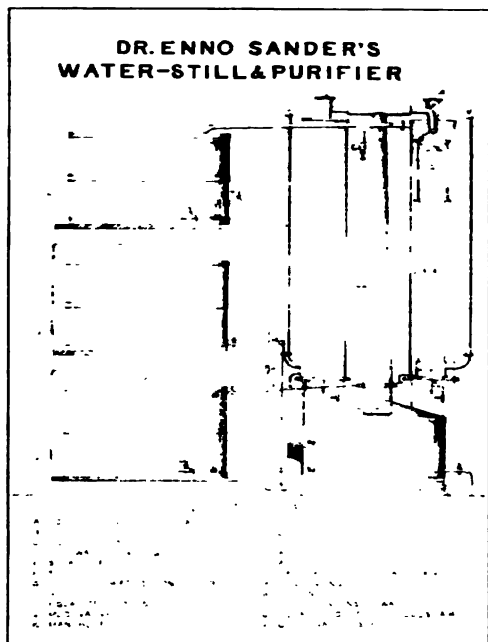
## B. PREPARATIONS.

### AQUAE.

*Aerated Distilled Water—Method of Production.*—Dr. Enno Sander describes the apparatus and method employed by him for the production of aerated distilled water, suitable for preparing aerated beverages, and for general drinking purposes. Without attempting to reproduce this interesting description in detail, which should be consulted in the original, the following may serve in a general way to explain the process employed and the functions of the apparatus illustrated in the accompanying draw-

ing (Fig. 54). The water supply for the distillation and condensation is obtained from an artesian well, and is drawn from a reservoir on top of the building, from which it passes direct into the condenser (*M*), one of which is shown in section entering at the bottom. Here it passes through the cooling spaces (*S*) over the condensing pipes (*R*), twelve in number, and is delivered hot, through the pipe (*D*) into the settling tank (*A*); or it may be diverted by means of a valve handled from below, into another tank for general factory purposes. From (*A*) the hot water reaches the purifying tank (*B*) in which it is treated with chemicals to precipitate its mineral ingredients, and from this it reaches through the

FIG. 54.

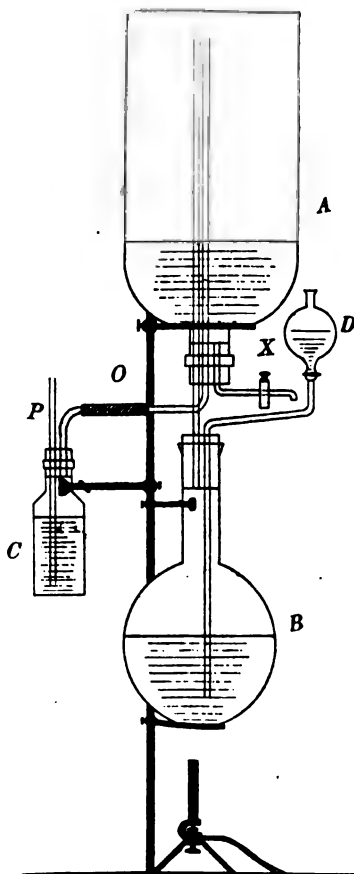


pipe (*F*) the still (*H*), entering at the bottom, steam being supplied from the boiler through steam pipes (*E*) into the steam coils within the still. The conical top of the still connects at its apex with a cylindrical, slightly conical shaft (*L*), through which the vaporized water ascends into the horizontal drum (*N*), which is connected at each end with the condensers (*M*), by means of an elbow that is fitted into a pipe (*O*) carrying pure sterilized air from the sterilizing apparatus (*P*) into the drum (*Q*), where the admixture of air and water vapor is effected. The aerated water vapor then passes into the condensing pipes (*R*) and, being condensed in its passage, collects, perfectly cold, in the reservoir (*T*)

beneath, reaching the storage tank (*C*) as a palatable aerated water, by its own gravity, through the conducting pipe (*G*), while the superfluous air escapes through the vent-pipe (*U*).—*Pacific Pharmacist*, Dec., 1907, 395-397.

*Ammonia-free Water—Efficient Apparatus.*—A. H. Dewey has devised the simple apparatus shown by Fig. 55 for securing a continuous supply of ammonia-free water. The six-liter bottle (*A*) inverted above the two-liter flask (*B*) serves as a receiver and, having a large air space, as an air condenser for the vaporized water, which is admitted from the distilling flask by a tube reaching nearly to the top of *A*, while air is admitted through a similar tube after its passage through concentrated sulphuric acid in the small flask (*C*). This is connected by means of a tube provided with a Bunsen valve, which acts as a safety tube, permitting the escape of air from the interior to relieve pressure, but prevents the admission of air, in case of a vacuum, other than that which has been rendered ammonia-free by its passage through tube *P* and the acid in *C*. The flask (*B*) is supplied with pure water, acidified with about 5 Cc. of concentrated sulphuric acid per liter by means of the dropping-funnel (*D*). After the bottle (*A*) has been thoroughly rinsed with acidified water, and steamed out by leaving the tap (*X*) open until the condensed water is free from acid, the tap is closed, and the water collected and drawn from the tap perfectly free from ammonia, as required. The source of heat is an ordinary Bunsen flame. The only attention required for continuous operation is to keep the flask (*B*) well filled with water.—*Pharm. Rev.*, July, 1908, 206-207.

FIG. 55.

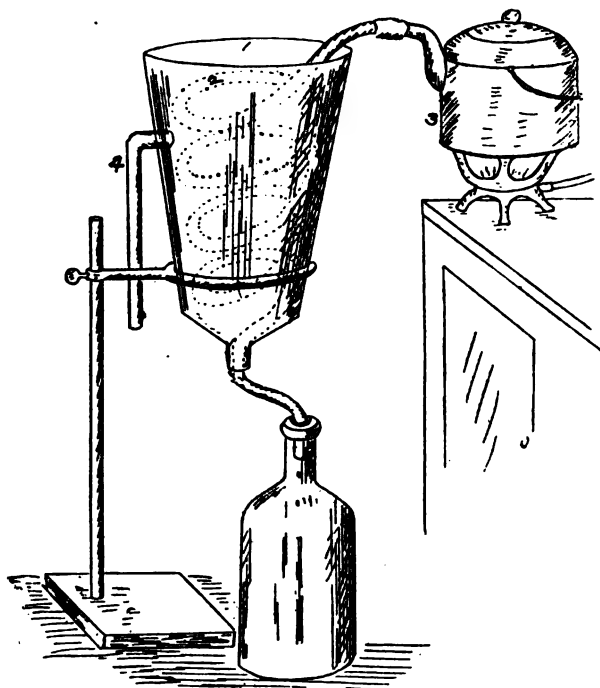


Ammonia-free Water Apparatus.

*Water Still—A Simple Home-Made Contrivance.*—For producing distilled water in small quantities, L. W. Marshall has contrived the still shown by Fig. 56. It consists of a tin percolator (*r*), to which, near the

top, a tin tube (4) is soldered for the overflow of the water from melting ice; a coil of pipe (2), which is attached to the spout of an ordinary tea-

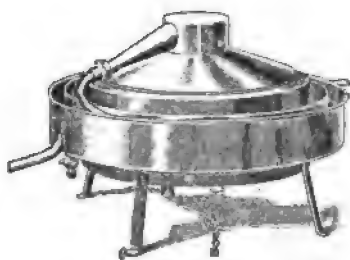
FIG. 56.



Water Still.

kettle (3), and extends below into the neck of a bottle. Cracked ice is used as the refrigerating medium. The use of this simple device is obvious.—*Drugg. Circ.*, Feb., 1908, 60.

FIG. 57.



Electric Water Still.

*Electric Water Still—An Efficient Apparatus.*—E. H. Sargent & Co., Chicago, have introduced the electric distilling apparatus shown by Fig.

57, which is operated either by an alternate or direct current of 110 volts, is easily managed and cleansed, and is capable of yielding 4.5 liters of distilled water in an hour, without requiring special attention.—Pharm. Ztg., liii (1908), No. 48, 479; from Chem. Ztg., 1908, No. 43.

*Cherry Laurel Water—Modification of the Process of the New "Codex."*  
—The new French "Codex" directs that cherry-laurel water be prepared by distilling 1 part of cut and crushed cherry-laurel leaves, covered with 4 parts of water, until 1.5 parts of distillate are obtained. Bridel obtained products in this way containing only 0.6 to 0.8 parts of hydrocyanic acid in 1000 parts, whereas the amount of HCN, as fixed by the International Pharmaceutical Congress at Brussels, should be 1:1000. By collecting only 1 part of distillate, the hydrocyanic acid found amounted to 1.2, 1.5, and 1.8:1000 in three experiments. Instead of cutting up the leaves and pounding them in a mortar, it is preferable to pass them through a mincing machine; the disintegrated leaves are at once put into the water in the still in small quantities at a time. When all the leaves are immersed, distillation is conducted slowly into a well-closed receiver, in which the distilling tube is well inserted to prevent, as far as possible, loss of gaseous prussic acid. Maceration previous to distillation is shown to be needless. The leaves employed should be as fresh as possible, old leaves giving a distillate much poorer in hydrocyanic acid. Working on 1 kilo. of leaves practically all the prussic acid is found to distil in the first 500 Cc. of distillate; there is therefore no advantage in continuing the distillation further. In determining the amount of hydrocyanic acid, only 25 Cc. of this strong distillate should be taken, which should be diluted with 75 mls of water before titration.—Pharm. Journ., July 20, 1907, 71; from Jour. de Phar. et Chim., 26 (1907), 21.

*Bitter Almond Water—Increase of Yield.*—L. Rosenthaler has practically demonstrated that under the conditions in which bitter almond water is prepared, a portion of the amygdalin remains undecomposed in the almonds employed. He attributes this to the fact that the enzyme (emulsin) of the bitter almonds (as is shown also in the case of other enzymes) loses its activity on the glucoside when a certain concentration of hydrolytic products is reached. On adding a few almonds (presumably "sweet" ? Rep.) to the still residue, so as to supply a fresh quantity of "emulsin," and again distilling the almond cake, an additional quantity of bitter almond water was obtainable.—Pharm. Ztg., lii (1907), No. 64, 669; from Südd. Apoth.-Ztg., 1907, No. 58.

#### CARBASUS.

*Iodoform Gauze—Formula.*—The following formula was recommended for inclusion into the new Italian Pharmacopœia at the Congress of Pharmaceutical Chemists in Milan: Iodoform, 3.33 Gm.; elemi, 0.05 Gm.; castor oil, 0.10 Gm.; acetone (sp. gr. 0.830), 52.0. This solution is to be

used for 1 M. of gauze. The absence of curcuma or eosine, added as coloring matter, is to be determined by extraction with ether, which should remain colorless.—Pharm. Ztg., lii (1907), No. 102, 1059; from Rép. de Pharm., 1907, No. 11.

*Iodoform Cotton and Gauze—Practical Suggestions to Secure a Uniform Product.*—The introduction of formulas for the manufacture of medicated cottons and gauzes in the recently published "British Pharmaceutical Codex," has prompted A. W. Gerrard to make some practical suggestions on the manufacture of iodoform gauze and cotton, which will be consulted with advantage in the original. The following may, however, profitably find place here. Mr. Gerrard observes preliminarily that he has a collection of six formulas for these dressings culled from various books and journals, both medical and pharmaceutical, and has no hesitation in saying that most of them are impossible, as they do not produce the simple 5 and 10 per cent. iodoform dressings, at present in demand. He says that in selecting gauze or cotton for this purpose they should be of the absorbent variety absolutely neutral to litmus. Gauze, technically known in the trade as mulls, 34 to 36 in. wide, varying in mesh from 24 to 36 to the linear inch, both on the warp and the weft; but it must be remembered that as the count increases, the weight and cost of the dressings increases, as heavy gauzes require more iodoform per yard than light gauzes. Gauze should be soft to handle, and free from stiffness imparted by sizing; and although a small amount of sizing is necessary for a good finish, the presence of starch as such is objectionable. The fabric, moreover, should be practically dry—2 to 4 per cent. of moisture being allowable, but not more. The best all-round solvent to employ is well-washed and purified methylated ether, sp. gr. 0.720; the best iodoform is the pure crystal, the solubility of which, in ether at 60° F., is 1 oz. solid to 7 ozs. fluid. The next essential is to determine what volume of iodoform solution will diffuse evenly throughout a given weight of dressing—this volume depending on the lightness, condition of compression, or cubic space the material is made to occupy previous to charging. If, for instance, 5 oz. (about 12 yards) of a 10 per cent. dressing is required, a good working formula is the following:

Take  $4\frac{1}{2}$  ozs. absorbent gauze, fold it lengthwise into six layers, roll it as tightly as possible on a spindle, withdraw the spindle, then tie the gauze tightly together with a ligature of string, leaving two long ends to the string, force the roll thus formed inside a cylindrical glass vessel into which it fits tightly, and force the roll to the bottom of the glass. The loose ends of string are to hang outside the glass, and are used for pulling out the gauze after it is charged. Now prepare a solution of  $\frac{1}{2}$  oz. of iodoform in 6 ozs. of ether, pour this on to the gauze, when it will soon diffuse itself through the mass, as seen by the pale yellow color the gauze attains. Pressure brought to bear on the gauze at this point will assist the even

distribution of the iodoform. The charged gauze can now be removed by means of the loose ligatures and unrolled; loosely hung for five minutes the ether evaporates, the gauze can now be re-rolled, and is ready for packing. It will not be difficult to understand that the diffusion of the iodoform in the mass of the dressing can never be accomplished with anything like perfection or scientific accuracy. There is sure to be a little more or less here and there in parts, but the dressing should not be highly patchy and irregular, but fairly even in color. Such being the case is good evidence that the charging has been well done. The storage or preservation of iodoform dressings is a matter of considerable importance. When packed in well-closed glass or metal containers these dressings retain their strength for long periods, but put up, as is usually the case, in parchment paper, or cartons, they steadily lose strength, the loss being proportionate to the age of the sample.—Pharm. Journ., Nov. 23, 1907, 674-675.

## CATAPLASMÆ.

*Cataplasma Kaolini* is the subject of a critical paper by Henry C. Blair, in the "Proceedings" of this Association, 1907, 184.

*Cataplasm of Kaolin—Formula Satisfactory.*—Edward S. Dawson finds that the U. S. P., VIII, formula and process for cataplasm of kaolin yield a fairly satisfactory product, but that the variability of the kaolin furnishes a source of much annoyance. The manipulation in the pharmacopœial quantity is within practical convenience, but on a larger scale than 2000 Gm. the pharmacist requires a hand or motor-power machine to insure thorough admixture of the ingredients.—Amer. Drugg., Aug. 12, 1907, 69.

*Cataplasm of Kaolin—Points to be Observed for its Satisfactory Preparation.*—After calling attention to the variability of commercial kaolins, I. V. S. Stanislaus points out the following rules to be observed in making the official cataplasm of kaolin:

1. The kaolin should be of the variety known in commerce as "Bolted China Clay," and should be purchased from bona fide merchants making a specialty of marketing clays and infusorial earth.
2. It should be heated for at least one hour under constant stirring before the boric acid is added.
3. The glycerin should be brought up to a temperature of 100° C. before adding to the mixed powders; thus heated it aids in forming the paste.
4. After the addition of glycerin, heat and stirring should be continued for at least an hour, this being done to allow for the completion of the familiar reactions between the bicarbonates, the borates, and the glycerin.
5. The product should be stirred diligently until cool, when the aromatic ingredients are added.
6. After the flavoring constituents are added, the cataplasm should *at once* be packed into *air-tight* containers. Ordinary tin ointment boxes

will *not do*. Tins provided with sunk-in lids, like lacquer or enamel containers, are the best.—Proc. Pa. Pharm. Assoc., 1907, 154-156.

#### COLLODIA.

*Acetone Collodion, B. P. C.—Unnecessarily Thick.*—George Coull calls attention to the inconvenient thickness of the acetone collodion of the B. P. Codex. It has been averred that when the directions are strictly followed, this preparation is not too thick; but the author points out that the B. P. collodion is practically a 2-per cent. solution of pyroxylin, and there has never been a suggestion that it is not thick enough, whereas the B. P. C. acetone collodion is a 5-per cent. solution, and much too thick to be convenient. If, however, a collodion thicker than the B. P. preparation is required for use as a corn paint, the author suggests 3 per cent. as a more suitable and more convenient strength than the B. P. C.—Pharm. Journ., May 2, 1908, 566.

*Collodium Anodynum—Formula.*—The following formula for an anodyne collodion is recommended in Therap. Monatsh. (1907, No. 12) for neuralgias, lumbago and muscular rheumatism: Aconitine, 0.1; veratrine, 0.6; flexible collodion, q. s. ad. 100.0. This preparation must not be applied to parched or abraded surfaces.—Pharm. Ztg., liii (1908), No. 8; 79.

*Collodium Salicylatum c. Anaesthesin, Unna—Formula.*—Salicylic acid, 10 p.; anaesthesin, 5 p.; spirit of ether, 5 p. Shake together and add collodion, 80 p.

*Collodium Salicylatum c. Extracto Cannabis, Unna—Formula.*—Salicylic acid, 10 p.; spirit of ether, 5 p. Shake together and add extr. cannab. ind., 5 p.; collodion, 80 p.—Pharm. Ztg., lii (1907), No. 53, 555.

#### ELIXIRIA.

*Elixir Curassao, N. F.*, is unfavorably criticised and an improved formula suggested by Henry C. Blair in the Proceedings of this Association, 1807, 185.

*Elixir e Succo Liquiritiae—Practical Manipulation.*—The "elixir e succo liquiritiae" of the G. P. evidently gives our German confreres much trouble, to judge from the frequency with which the formula is criticised. Caesar & Loretz (Herbstbericht, 1907) make the following practical suggestions concerning the manipulation: To the lukewarm solution of 1 part purified extract of licorice and 3 parts of fennel water add gradually, with shaking, 1 part of liquor ammonii anisatus, and set the mixture aside at about 20° C. for 10 to 14 days; then filter through a well-covered "quick-filter" direct into the container in which it is to be preserved. Separation of anethol at low temperatures is unavoidable.—Pharm. Ztg., lii (1907), No. 77, 812.



*Elixir Succo Liquiritiæ*—*Proposed Formula for the G. P.*—The Pharmacopœial Revision Committee of the Rhenish Chamber of Apothecaries proposes the following improved formula for the preparation of elixir e succo liquiritæ: 20 p. of extract of licorice are dissolved in 2 p. of fennel water; 2 p. of alcohol are added and the liquid decanted after 3 days, the rest being filtered. Then 3.3 p. of spirit of ammonia, 0.3 p. of anethol, and 0.05 parts of castor oil are added, followed by sufficient fennel water to make 100 parts. In this formula the quantity of anethol is reduced to one-half, and loss of ammonia is obviated by filtration before its addition. The addition of castor oil is also considered expedient.—Apoth. Ztg., xxiii (1908), No. 18, 179.

*Elixir Ferri, Quinina et Strychnina Phosphatum, U. S. P., VIII—Formula Satisfactory.*—Edward S. Dawson finds that the official formula for elixir of iron, quinine and strychnine phosphates, when carefully followed, yields a product that is pharmaceutically elegant, and superior to the various other formulas that have been tried. The formula and working process are complex, and must be carefully and exactly followed if the pharmacist desires to obtain an elixir that will be reasonably permanent. As prepared by the author it shows no change whatever after keeping it a year.—Amer. Drugg., Aug. 12, 1907, 69.

*Elixir Ferri, Quinina et Strychnina Phosphatum, U. S. P., VIII—Improved Formula.*—Alfred I. Cohn considers the formula for this preparation to be unnecessarily complicated, and recommends the following simple formula which he has for years used satisfactorily:

Soluble ferric phosphate.....	17.500 Gm.
Quinine.....	8.750 Gm.
Strychnine .....	0.275 Gm.
Alcohol .....	60.000 Cc.
Distilled water.....	30.000 Cc.
Aromatic elixir to make.....	1000 Cc.

Dissolve the ferric phosphate in the water by the aid of heat and add 400 Cc. of aromatic elixir. On the other hand, dissolve the quinine and strychnine in the alcohol by the aid of heat, and add to the solution 400 Cc. of aromatic elixir. Now pour the alkaloidal solution into the solution of iron phosphate and add sufficient aromatic elixir to make the whole measure 1.000 Cc. A fine, green preparation results, which keeps well. It is important that the alkaloidal solution be poured *into* the iron solution and not *vice versa*.—Amer. Drugg., July 8, 1907, 5.

Referring to the above formula proposed by Dr. Cohn, Otto Raubenheimer observes that its author overlooks the important point that the U. S. P. elixir is an elixir of the three phosphates (of "triple phosphates," as it might appropriately be called), whereas in Dr. Cohn's formula only the iron is present as phosphate. Mr. Raubenheimer considers the

U. S. P. formula all right, although he admits that it is somewhat complicated.—*Ibid.*, Aug. 12, 1907, 70.

*Elixir Glycerophosphates Compound—Darkening Prevented by the Omission of Sugar.*—Professor D. V. Whitney gives a formula for a compound elixir of glycerophosphates in which he directs as a solvent for the various salts employed a vehicle composed of 2.5 Cc. oil of orange, 100 Cc. alcohol, 100 Cc. angelica wine, 300 Cc. glycerin, and sufficient water to make 1000 Cc. of elixir. The preparation does not darken. The other ingredients are mentioned as “glycero-phosphites” in one instance, and in all the others—sodium, iron, manganese, quinine and strychnine—simply as “phosphites.” It is suggested that the darkening of other preparations is due to the sugar present in them.—*Proc. Mo. Pharm. Assoc.*, 1907, 109–110.

*Elixirs of Terpin Hydrate—Formulas.*—H. D. Morgan recommends the following formulas for preparing

*Elixir of Terpin Hydrate:*

Terpin hydrate.....	128 grains.
Glycerin .....	8 ounces.
Alcohol .....	8 ounces.

Dissolve the terpin hydrate in the glycerin by aid of heat, then add the alcohol gradually and mix. In this way the loss of alcohol is lessened.

*Elixir of Terpin Hydrate and Codeine Sulphate* is made in the same way, dissolving in the glycerin 16 grains of codeine sulphate.

*Elixir of Terpin Hydrate and Heroin* is made by dissolving 5  $\frac{1}{3}$  grains of heroin hydrochloride, along with the terpin hydrate, in the glycerin, and substituting  $\frac{1}{2}$  ounce of tincture of vanilla for the same quantity of alcohol.—*Pacific Pharm.*, Nov., 1907, 349–352.

*“Absinthe” Liqueur—Cultivation of Plants Employed for its Production.*—According to J. Boyer the following plants come under consideration for the “absinthe” industry (see also “Absinthe,” *Oils* under Organic Chemistry): The common wormwood (*Artemisia absinthium*), small-sized wormwood (*Artemisia pontica*), hyssop (*Hyssopus officinalis*), balm (*Melissa officinalis*). The common wormwood serves to give the “liqueur” the characteristic spicy and bitter taste; the other herbs help to form the aroma and pleasant taste. *Artemisia absinthium* is gathered by cutting the shrubs close to the ground with a pair of hedge-shears; the cut-off plants are spread out on frames to dry; when dry cut in the same way as chaff and packed in bags which, when filled, weigh 80 to 90 kilos. *Artemisia pontica* is usually cut with a scythe, gathered on linen sheets of 1 square meter, and finally tied into a bale. What has been cut off during the day is brought into the storehouse every evening, as the plant must not be left in the open air over night. The cultivation of *Hyssopus officinalis*

*nalis* and *Melissa officinalis* is carried on in the same manner. The young plants are partly grown from seed and partly obtained from the old shrubs, which are divided into several parts; the use of cuttings is also common. For gathering the plants a kind of sickle is employed; they are dried on a frame similar to that used for common wormwood.—Schimmel's Rep., Oct., 1907, 98; from Rep. of Roure-Bertrand Fils.

## EMPLASTRA.

*Plasters and Protective Tissues—Bacteriology.*—G. Pinchbeck has investigated the subject of plasters and protective tissues with two objects in view—first to ascertain the relative sterility of commercial samples of spread plasters and protective dressings, stored under and exposed to varying conditions; the second, to suggest, where practicable, modifications of existing formulae so as to reduce the liability to infection from pathogenic organisms during manufacture to a minimum, and render the finished preparation as sterile as possible. The results of his investigations on the first question warrant the conclusion that all plasters, unless sterilized, are septic, and that atmospheric exposure diminishes the degree of sterility. As regards the most effective methods of rendering plasters aseptic, these, depending on the nature of the plaster, etc., may be accomplished by means of heat, solvents, chemicals, or fractional sterilization, examples of which are given. The author, however, suggests that the plasters at present official (B. P.) should be dismissed, in favor of improved formulae, founded on a rubber basis and sterilization.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1907, 418–430.

*Emplastr. Hydrargyr. Molle, Unna—Formula.*—Triturate 20 p. metallic mercury and 10 p. turpentine together until the globules of metal are completely extinguished; then carefully combine the mixture with 60 p. lead plaster, 5 p. castor oil and 5 p. wool-fat, previously melted together.—Pharm. Ztg., lii (1907), No. 53, 555.

## EMULSA.

*Emulsite—Formula of the Belgian "Formulaire."*\*—The following formula for an emulsifying preparation is proposed for the Belgian National Formulary of Pharmaceutical Preparations, under the title "Emulsite," with the requirement that oil emulsions, unless otherwise specified, shall be made by its aid: Tragacanth, 10.0; gum-arabic, 5.0; gluten, 5.0; glycerin, 20.0; dist. water, 50.0; alcohol, 10.0. The tragacanth, gum-arabic and gluten are mixed, then triturated with the glycerin and water, the alcohol being added last, so that a homogeneous mixture results. From this

*Emulsite 1:10* is prepared by mixing 10 parts of it with 10 p. of gly-

---

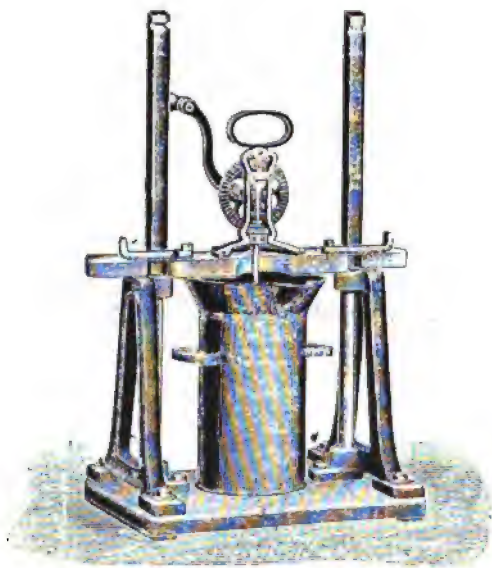
\* "Formulaire national de préparations pharmaceutiques."

cerin and 80 p. of water; and of this emulsite 1:10, again, 30 parts are to be used for emulsifying 10 parts of oil—as exemplified in the following formula for

*Looch blanc*: Ol. amygd. dulc., 10.0; syrup. simpl., 25.0; aq. flor. aurant., 10.0; emulsite, 1:10, 30.0; aq. distill., 25.0. The almond oil, emulsite and orange-flower water are mixed by agitation until an emulsion results, and the syrup and distilled water are then added.—Apoth. Ztg., xxiii (1908), No. 13, 127; from Journ. de Pharm. d'Anvers, 1908, p. 17.

*Emulsifying Apparatus—Efficient Construction*.—Dr. A. Kirchner has devised the emulsifying apparatus shown in two illustrations (Figs. 58 and 59), which rapidly and efficiently produces emulsions of cod-liver

FIG. 58.



Emulsifying Apparatus.

oil either extemporaneously on a small scale or in quantities. The essential parts of the apparatus, all of stout construction, consist of the mixing cylinder with flaring mouth, of brass, tin-lined; of the stirring-apparatus proper, which can be raised or lowered at will from the mixing cylinder; and of the upright supports, upon which the horizontal bar supporting the stirring-apparatus slides. The stirring-rod is provided with wings which are rapidly revolved in opposite directions by means of the cog-wheel attachment. When the process of emulsification is ended, the stirrer is easily elevated from the cylinder by the aid of the handle, and maintained in position by interlocking springs.—Apoth. Ztg., xxii (1907), No. 66, 687.

*Emulsions—Rapid Method of Detecting Soap.*—Duyk recommends the following rapid and quantitative method for the detection and estimation of soap in emulsions: A known weight of the emulsion, about 20 Gm., is diluted with a known volume of warm water; sufficient sugar is added to the mixture to form a strong syrup; this is then warmed on a water-bath until it separates into two layers, the lower syrupy layer being clear or only faintly opalescent. The latter is separated and mixed with a strong solution of sodium chloride; any soap present is thus salted out and may be collected, washed with salt water, and redissolved in strong alcohol,

FIG. 59.

**Emulsionizing Apparatus.**

which removes it in a state of purity. The method is quantitative.—Pharm. Journ., April 18, 1908, 518; from Annal. de Chim. Analyt., 12 (1907), 345.

*Emulsion of Castor Oil—Soap as Emulsifier.*—M. I. Wilbert applies the principle of emulsification with soap, which has recently been favorably discussed in several European journals, to the preparation of an emulsion of castor oil, and gives the following simple formula :

Castor oil .....	50.0 Cc.
Powdered castile soap.....	1.5 Gm.
Spirit of peppermint .....	3.0 Cc.
Solution of saccharin, N. F. ....	1.0 Cc.
Distilled water, to make.....	100.0 Cc.

To the powdered soap, in a clean, dry mortar, add the castor oil and the spirit of peppermint, mix well and gradually add, with constant stirring, the solution of saccharin and enough water to make 100 Cc. A white, limpid emulsion results, which separates partially on long standing, but will readily mix again on shaking.

By substituting 5 Cc. of the liquid soap proposed by the author (see Proceedings, 1907, 119-120), for the powdered soap, the emulsion may be made by simply shaking the ingredients in a bottle.—Amer. Journ. Pharm., Nov., 1907, 524.

*Castor Oil Emulsions—Various Formulas.*—With the object of improving on the method of emulsification with acacia, generally in use, whereby inconveniently thick emulsions are obtained which even in 30 per cent. concentrations are frequently not acceptably taken, L. Bourdier has experimented with various emulsifying agents, with results as follows:

*Egg Yolk*, No. 1; castor oil, 30.0; water, 10.0; yields a good emulsion, but does not keep well.

*Tragacanth*, in powder, 1.5; castor oil, 30.0; water, 60.0; yields a stable emulsion of good fluid consistence, by triturating the powder and oil together and, after scraping off the triturate from the pestle, adding all the water at once and thoroughly agitating. With more than 30 per cent. of oil, the emulsion is too thick; with less tragacanth, it loses its stability.

*Lime Water*, on vigorous shaking with castor oil, is capable of producing acceptable emulsions up to 75 per cent. concentration, but the emulsions separate after standing several hours into the original components.

*Casein*, in form of the 10 per cent. casein saccharate proposed by Léger twenty years ago (see Proceedings 1888, 600), is well adapted for the production of 60 per cent. emulsions, which are best prepared as required according to the following formula: Casein saccharate, 5.0; castor oil, 30.0; water, 15.0. The saccharate is triturated with the oil, the water added, and the mixture well agitated.

*Soap* is capable of yielding acceptable emulsions of still greater concentration, according to the following formula: Powdered almond-oil soap (of the "Codex"), 2.5; castor oil, 80.0; water, 20.0. The manipulation is the same as with casein saccharate, and a creamy-white emulsion is formed which keeps well for several months. The aperient action of the soap adds to the effectiveness of the preparation, so that it may be given in the same doses as the pure castor oil. The taste of all these emulsions

may be corrected by the judicious addition of saccharin and oil of peppermint.—Pharm. Ztg., lii (1907), No. 80, 841; from Journ. de Pharm. et Chim., xxvi (1907), No. 5.

*Emulsion of Cod Liver Oil—Formula for a Stable and Agreeable Preparation.*—E. Walter communicates the following formula, which he characterizes as producing a really permanent and agreeably tasting emulsion of cod-liver oil (with hypophosphites? Rep.) if the prescribed conditions are observed in every particular:

White gum arabic, in very fine powder..... 320.0 Gm.

are thoroughly triturated in a large mortar with

Codliver oil, prepared with steam ..... 1200.0 Gm.

Then add *at once* (in one portion) 600 Gm. of the following solution:

Sodium hypophosphite ..... 12.0 Gm.

Calcium hypophosphite ..... 24.0 Gm.

Distilled water ..... 890.0 Gm.

and stir completely, until after a few minutes the oil is combined. The emulsion is then thoroughly stirred for an additional quarter of an hour, and then the rest of the solution (of hypophosphites) is incorporated in small quantities at a time. Then add

Simple syrup ..... 100.0 Gm.

and lastly the following solution:

Vanillin ..... 0.5 Gm.

Saccharin ..... 1.0 Gm.

Oil of bitter almond (free from hydrocyanic acid) ..... gtt. xxiv.

Oil of cinnamon ..... gtt. xxvi.

Oil of anise ..... 4-5.0 Gm.

Alcohol ..... 100.0 Gm.

—Pharm. Ztg., liii (1908), No. 8, 79; from Jour. d. Pharm. f. Elz.-Lothr., 1907, No. 17.

*Emulsio Olei Morrhue cum Hypophosphatibus, U. S. P., VIII—Modification of Manipulation.*—Edward S. Dawson observes that failure may result if the official directions for manipulation are followed too closely when making this emulsion. He found that time can be saved and a perfect emulsion will result by rubbing the powdered acacia with half of the volume of cod-liver oil specified in the formula, adding to the mixture at once all the required amount of water, and triturating rapidly until the oil is thoroughly emulsified; then adding the balance of the cod-liver oil in small portions, triturating each portion until fully emulsified. The official directions may then be followed, and the resultant emulsion will be so.

perfect that a bottle which has contained it can be so thoroughly cleaned with cold water that not a trace of the oil will remain.—*Amer. Drugg.*, Aug. 12, 1907, 69.

*Balsam of Fir Emulsion—Formula.*—Dr. John T. Davison gives a formula for a balsam of fir emulsion which he considers will admirably replace a “balsamic cough mixture,” exploited to the medical profession and considerably in vogue. A stock balsam mixture is first prepared. This consists of: Balsam of fir, 1 p.; Venice turpentine, 1 p.; olive oil, 2 parts. Take of this

Balsam mixture .....	48 minims.
Oil of wintergreen .....	30 minims.
Powdered acacia .....	3 drachms.
Spirit of chloroform .....	4 drachms.
Tartar emetic .....	$\frac{1}{2}$ grain.
Diluted hydrocyanic acid .....	6 minims.
Syrup .....	12 drachms.
Water, enough to make .....	8 ounces.

Make an emulsion. Of course, the proportion of the balsam mixture may be varied somewhat to meet individual requirements.—*Drugg. Circ.*, Dec., 1907, 764.

*Emulsio Olei Gynocardiae (Lepra), Unna—Formula.*—Emulsify 1 op. oil of gynocardia and 20 p. oil of almonds with 15 p. powdered acacia and 20 p. distilled water; then add sufficient lime water to make 100 parts.

#### EXTRACTA.

*Belladonna Extracts—Limits of Variation in Alkaloid Content.*—Marin has endeavored to throw some light on the permissible variations in the alkaloidal content of extract of belladonna, which could not be established at the Brussels Conference owing to the wide variations—1.5 and 4.5 per cent.—mentioned in the literature. His investigations point out that a minimal content of 1.5 per cent., which is also prescribed in the G. P. IV, is too low. In all the extracts of belladonna leaves examined, obtained from different sources, the alkaloidal content was never less than 2.5 per cent., and fluctuated from this percentage up to 4–4.3 per cent. He considers it quite possible that the low percentages noted by German authors are due to the fact that Austrian belladonna leaves, which are found in large quantities on the market, are in great part derived from *Scopolia carniolica*, and therefore not a valid drug. Italian belladonna leaves have been frequently found by the author to contain the leaves of *Phytolacca decandra*.—*Pharm. Ztg.*, liii (1908), No. 28, 278.

*Extractum Ferri Pomati—Components.*—L. Rosenthaler and A. Siebeck find both ferro- and ferri-salts in the officially prepared extractum ferri pomati, and that a portion of the malic acid of the apples is converted



into oxal-acetic acid. The presence of this acid, and the conversion of the malic acid into it by Denigès' method, is utilized by the authors for the identification of this extract.—Pharm. Ztg., liii (1908), No. 8, 78.

*Extractum Ferri Pomati—Determination of Iron.*—The method of the Austr. Pharm., VIII, for the determination of iron in extractum ferri pomati, like that of the G. P., IV, consists in incinerating the extract, moistening the ash with nitric acid, and after again heating to redness, dissolving the ash in hot hydrochloric acid, etc. A. Fernau calls attention to the necessity of prolonged heating after the addition of nitric acid, even after nitrous vapor ceases to be evolved, so as to insure the removal of the last traces of nitrate, since the presence of this causes the development of chlorine in the hydrochloric acid solution, and this to the extent of its presence vitiates the iodometric estimation of the iron. Indeed, he considers the treatment with nitric acid superfluous, since the ash will be found perfectly soluble on digesting it with 5–6 Gm. of conc. hydrochloric acid.—Pharm. Ztg., liii (1908), No. 19, 191; from Ztschr. d. Allg. Oesterr. Ap.-Ver., 1908, No. 5.

Criticising Fernau's strictures concerning the use of nitric acid in prescribed process for the estimation of iron in extractum ferri pomati, H. Blau maintains that the omission of the treatment is by no means justified. Without this treatment the incineration must be continued for about two hours to produce a carbon-free ash, and that the solution of the resulting ash requires greatly prolonged heating with hydrochloric acid. The use of nitric acid is therefore not superfluous; it insures the complete oxidation of the iron, avoids the necessity of prolonged heating, facilitates the solution of the iron, and shortens the time required for the experiment.—Ibid., No. 28, 278; from ibid., 1908, No. 10.

*Extract of Meat—Detection of Yeast Extract.*—C. M. W. Grier observes that some analysts find that Searl's method for the detection of yeast extract in extracts of meat (see Proceedings, 1904, 530) does not always give satisfactory proof of the presence or absence of yeast. He finds that this failure is mostly due to the Fehling's solution, modified as suggested in Searl's method, not remaining clear or boiling. If the solution of meat extract and the Fehling's solution be added to each other in the cold and then boiled up, and kept boiling for one to two minutes, it sometimes happens that a light green precipitate is produced, which masks any curdled precipitate which may be present. If these conditions are closely observed no difficulty should be experienced in detecting even less than one per cent. of yeast extract, especially if (as in Searl's modification of his process) the part thrown down by methylated spirit be employed for the test. The author describes in detail the method as conducted in the analytical laboratory of Messrs. Lorimer & Co. with uniform success.—Pharm. Journ., April 4, 1908, 441.

*Extr. Visci Albi Aquosum—Preparation.*—While preparations of mistletoe for external use have for some time been used in medicine, the drug has more recently attracted some attention in France as an internal remedial agent for the treatment of the hemorrhagic coughs in phthisis. Gaultier has pointed out the value both of the powdered drug and of an extract, and Delassus now proposes a formula for preparing an aqueous extract, as follows: 500 p. of the dry, young twigs and leaves of the mistletoe, in form of powder are infused for 12 hours in 3000 p. of boiling water, expressed, and the residue is treated twice successively with 1500 p. of boiling water in the same manner. The united and filtered infusions are evaporated to syrupy consistence on a water-bath, and finally to the consistence of a thick extract in a vacuum over sulphuric acid. The brown extract so obtained has an agreeable aromatic taste and odor and is readily formed into pills. It is dispensed also in form of *Syrup* and in form of *Solution* for hypodermic use (which see under "Syrupi" and "Liquoses").—Pharm. Ztg., lii (1907), No. 61, 739; from L'Union pharm. 1907, No. 8.

#### FLUIDEXTRACTA.

*Fluidextracts.*—Joseph Feil communicates a compilation of data relating to fluidextracts in the "Proceedings" of this Association, 1907, 499-501.

*Fluidextracts—Possible Variation in Alcohol Content due to Formation of Precipitates.*—John Uri Lloyd draws attention to an experience during a study of "Precipitates in Fluidextracts," thirty years ago, which brought out the fact that whenever an alcoholic liquid casts a precipitate the liquid becomes stronger in its percentage of alcohol. Recent experiments, undertaken to establish the probable extent of variation in the alcoholic strength of fluidextracts from this cause, gave the following figures:

Fluidextract.	Assayed.	
	Freshly.	After Precipitation.
Podophyllum.....	53 per cent.	65 per cent.
Eriodictyon .....	77 per cent.	86 per cent.
Leptandra .....	61 per cent.	62 per cent.
Jalap .....	83 per cent.	98 per cent.
Grindelia .....	83 per cent.	90 per cent.
Cimicifuga .....	68 per cent.	70 per cent.
Hydrastis.....	71 per cent.	72 per cent.

Undoubtedly, this feature will be investigated carefully by the Government, and proper allowance made therefor under the Pure Food and Drug Act.—Amer. Journ. Pharm., Jan., 1908, 39; from Eclectic Med. Gleaner, iii (1907), No. 6, 505.

*Fluidextract of Belladonna Leaves—Alternative Assay Process.*—Dr. A. B. Lyons observes that, although the pharmacopœial process for the assay

of fluidextracts of the mydriatic drugs gives in skillful hands fairly satisfactory results, it has its difficulties, which he overcomes by an alternative process dependent on the removal of components precipitable by solution of lead subacetate. He considers this the simplest and the best, and to be particularly adapted to preparations of belladonna and hyoscyamus leaves. Referring to the original paper for the details of the method, this may be here outlined as follows: To a mixture of 20 Cc. of solution of lead subacetate (U. S. P.) and 150 Cc. of distilled water add with constant shaking 20 Cc. of fluidextract of belladonna leaves, adjust the mixture to exactly 200 Cc., and filter clear through a double filter. To the filtrate add about a gram of granulated sodium phosphate (to remove the excess of lead, which is manifested in the filtrate by a perceptible sweet taste), and, after allowing the precipitate to settle a few minutes, test a few drops of the clear liquid with a little sodium phosphate, and add more of this to the mixture, if necessary, until this produces no turbidity, and is in slight excess. The mixture is then filtered once more, and 100 Cc. of the filtrate (= 10 Cc. of the fluidextract) is then shaken out with 25 Cc. of chloroform and 2 Cc. of water of ammonia in the usual manner, and the alkaloid determined both by weighing and by titration.—Pharm. Rev., Jan., 1908, 22-24.

*Fluidextract of Colchicum Seed—Preliminary Removal of Fixed Oil from the Seed.*—The annoyance of a separation of fixed oil in fluidextract of colchicum seed, which is extracted even by the dilute alcoholic menstruum directed in the Pharmacopœia, has been frequently noted. Edward S. Dawson finds that this oil possesses a very bitter taste, and infers that it must contain some of the alkaloidal constituent of the drug. The presence of the oil is a nuisance, however, and it should be removed, if this can be done without at the same time removing some of the alkaloid. He finds that this may be done by percolating the powdered seeds (No. 30 powder) with commercial gasoline (known as 74 degrees fluid), in which the colchicine is insoluble, 3 Cc. of percolate from each 1 Gm. of seed being sufficient. On evaporation and drying at 140° F. about 3.25 per cent. of a fixed oil, of about the color and density of linseed oil and having a bland taste, entirely devoid of bitterness, is obtained. The dried powder is then extracted as officially directed. In the experiment the powdered seeds assayed 0.59 per cent. of alkaloid; the fluidextract, thus freed from fixed oil, assayed 0.60 per cent.—Amer. Drugg., Aug. 12, 1907, 69.

*Fluidextract of Ergot, Pharm. Belgic.—Improved Process and Tests.*—The process of the Belgian Pharmacopœia for fluidextract of ergot differs from that of the G. P., IV, only in that the oil is preliminarily removed from the drug with petroleum ether. W. Dulière suggests as an additional betterment of the process, that the quantity of menstruum (20 per cent.

alcohol) for the preliminary maceration be increased (from 350 Gm.) to 600 Gm. for 1000 Gm. of the ergot used, and that the exhaust percolate be simply evaporated to 150 Gm. after addition of 17 Gm. of hydrochloric acid (1.18), and added to the 850 Gm. of reserve percolate. The author, furthermore, finds that the official (Belgian) requirement of 15 per cent. dry residue on evaporation is not always attainable (the best preparations being obtained with the Russian drug), and recommends the following

*Test of Identity and Quality:* Mix 2 Cc. of the fluidextract with sufficient powdered quicklime to make a paste, and incorporate with this sufficient talc to make a dry powder, which is then extracted with ether. Evaporate 10 Cc. of the ether solution to dryness, extract the small residue with 2-3 Cc. of glacial acetic acid, and carefully superimpose this solution upon a few cubic centimeters of strong sulphuric acid. A violet-blue zone will develop at the point of contact of the two layers, which gradually spreads throughout the acetic acid layer.—Pharm. Ztg., lii (1907), No. 80, 840; from Journ. d. Pharm. L'Anvers, 1907, No. 16.

*Liquid Extract of Ergot—Limit of Pharmacological Activity?*—Careful pharmacological experiments made with an identical specimen of liquid extract of ergot, covering a period of twelve months, during which it was exposed to conditions that might be expected on the pharmacist's shelf, lead Dr. Gordon Sharp to the conclusion that a good liquid extract will keep active for a reasonably long period, which need not exceed twelve months. He found at the end of this time undiminished activity; half a fluidrachm, six minutes after it was given, produced the well-known tonic contraction of the uterine muscle, and fifteen minutes after the ergot was given the action was well marked. Ergot is one of the drugs that has been loudly abused and, again, as highly praised. Some practitioners have so little faith in all preparations of the drug that on every occasion they make for themselves an infusion of the dry fungus as it is wanted. The author's experiments show that this is no longer necessary for him to do this, whatsoever may have been necessary in the past. All he has to do is to purchase the liquid extract from a pharmacist who has a reputation to lose. No doubt the fungus readily undergoes decomposition; but it is the business of the maker to see to it that he employs sound ergot in making his galenicals, and we may trust him to do this.—Pharm. Journ., Jan. 25, 1908, 82.

*Fluidextract of Hydrastis—Assay.*—Dr. Georg Heyl recommends a modification of van der Haar's method for the convenient and comparatively rapid estimation of hydrastine in fluidextract of hydrastis, which is carried out as follows: 10 Gm. of the fluidextract are diluted with 20 Gm. of water, evaporated in a capacious, tared Erlenmeyer flask to 10 Gm., 1.5 Cc. of 12 $\frac{1}{2}$  per cent. hydrochloric acid added, and the weight of the liquid, after cooling, brought to 20 Gm. by dilution with water; then,

0.5 Gm. of calcined infusorial earth is added, the liquid is vigorously shaken, filtered through a dry filter of 5 Cm. diameter, and 10 Cc. of filtrate are collected in a vial of 100 Cc. capacity. Now add to the filtrate 4 Cc. of ammonia water (10 per cent.), and 25 Cc. of ether, shake the mixture vigorously during several minutes, add 25 Cc. of petroleum ether (b. p. 50°–75° C.), and, after shaking a few minutes, 1.5 Gm. of powdered tragacanth, continuing the shaking vigorously until the liquid becomes clear; then immediately transfer 40 Cc. of the clear liquid to a weighing flask in which it is allowed to evaporate spontaneously, and finally dried on a water-bath. The weight of the residue, multiplied by 25, gives the percentage of hydrastine in the fluidextract.—Apoth. Ztg., xxii (1907), No. 84, 907.

*Fluidextract of Hydrastis—Rapid Method of Assay.*—C. Kollo recommends the following method for the direct titration of fluidextract of hydrastis with Mayer's reagent which gives quick results with sufficient accuracy: Dilute 20 Cc. of the fluidextract with distilled water to 100 Cc., and place 10 Cc. of the dilution in each of five test-tubes; add in consecutive order 1.5, 1.6, 1.7, 1.8 and 1.9 Cc. of the reagent and, after thoroughly shaking, filter into five tubes in the same order. Then place a drop of each filtrate on a glass plate on a black surface, and add to each drop of filtrate a drop of the diluted fluidextract. The first production of turbidity in one of the filtrates indicates the completion of the test. On multiplying the quantity of reagent used in the filtrate by the factor (0.0223) and the product by 50, the percentage of hydrastine in the sample is at once ascertained, each Cc. of the reagent corresponding to 0.0223 Gm. of the alkaloid. The reagent is made by dissolving 13.546 Gm.  $\text{HgCl}_2$  and 49.8 Gm.  $\text{KI}$  (both deprived of moisture in the exsiccator) in sufficient distilled water to make 1000 Cc. If under the conditions mentioned no turbidity should result with 1.9 Cc. of the reagent, increasingly larger quantities must, of course, be used with fresh portions of the diluted fluidextract until a reaction is obtained. A good fluidextract should contain at least 1.8 per cent. of hydrastine, and if of such strength 1.9 Cc. of reagent would be slightly in excess.—Pharm. Ztg., lii (1908), No. 10, 98; from Pharm. Post, 1907, No. 52.

*Fluidextract of Ipecac—U. S. P. VIII Method of Assay Unsatisfactory.*—Experiments made by Clarissa M. Roehr confirm the recent unfavorable criticisms made by Professor H. M. Gordin and others on the assay process of the U. S. P. VIII. The author finds that this fluidextract may be assayed successfully by the official process given for fluidextract of belladonna, but that the best results are obtained by Professor Gordin's process (see Proceedings 1906, 379–380). Good results are also obtained by the method recommended by Dr. Lyons.—Pacific Pharm., Nov., 1907, 352–354.

*Fluidextractum Rhamni Purshianae Aromaticum, U. S. P. VIII—Pre-*

*cautionary Measures when Making Large Quantities.*—Edward S. Dawson finds this fluidextract when made by the U. S. P. formula and process very satisfactory, but makes some practical remarks concerning the manipulation when the quantity to be prepared is largely in excess of the pharmacopœial. When making, for example, five times the U. S. P. quantity, he experienced that the vessels in ordinary use were too small, even though apparently large enough, to accommodate the mixed powdered drugs when the required amount of water was added. This was due to the swelling of the mixture during the maceration, necessitating the division into several portions. After drying the swollen powder, which also had to be done in divided portions, the process was easily carried out as officially directed.—*Amer. Drugg.*, Aug. 12, 1907, 70.

*Liquid Extract of Cascara Sagrada—Improved Formula.*—In the course of experiments to obtain a liquid extract of cascara which would make a clear mixture with water, J. H. Franklin finds the following formula to meet this requirement :

Cascara sagrada, in No. 20 powder ..	20 ozs.
Glycerin .....	8 fl. ozs.
Stronger solution of ammonia .....	80 minims.
Distilled water, a sufficient quantity to make .....	20 fl. ozs.

The powder, moistened with 15 fl. ozs. of the water, is set aside 6 hours, then packed loosely in a percolator and percolated to exhaustion with distilled water; the percolate is evaporated to 12 fl. ozs., the glycerin is added when cool, the mixture allowed to stand, then filtered. Finally, the strong solution of ammonia is added to the filtrate. While the liquid is miscible with water before the addition of the ammonia, the mixture loses its brilliancy in about 30 minutes; whereas, if the ammonia has been added, as directed in the formula, the mixture remains bright. The liquid has only a faint ammoniacal reaction, is richer in color than the B. P. preparation, and does not deposit on keeping. It is also less costly and probably more active than the official product.—*Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy)*, 1907, 433-434.

*Fluidextract of Frangula—Inefficiency of the Identity Test of the G. P. IV to Distinguish from Cascara Sagrada.*—H. Kroeber observes that the identity test of the G. P. IV for fluidextract of frangula, which depends on the formation of a fine red compound with alkalies (ammonia), can be regarded only as a "group-test," since the same reaction is given by extractions from aloes, senna and rhubarb in consequence of their oxymethyl-quinone content. Consequently, also, the test does not permit a distinction of fluidextract of cascara sagrada. The author, however, considers this of little importance since his experiments have demonstrated that frangula contains even a larger percentage of the active oxymethylantraqui-

none than does cascara bark.—Pharm. Ztg., liii (1908), No. 10, 99; from Pharm. Praxis, 1907, No. 11.

*Fluidextract of Frangula—Microscopic Method of Distinction from Fluidextract of Cascara Sagrada.*—According to R. Reutsch fluidextract of frangula may be distinguished from that of cascara sagrada as follows: A small quantity of the fluidextract is dried at 100° C., powdered and transferred to a small watch-glass, which is placed on a microburner, covered with an object glass, and sublimed at 140° C. In the case of fluidextract of frangula, handsome needle-shaped crystals are soon developed and these frequently cross each other; whereas the fluidextract of cascara sagrada yields no crystalline sublimate when treated in the same way.—Pharm. Ztg., liii (1908), No. 28, 278; from Pharm. Post, 1908, No. 24.

*Fluidextractum Sennæ—Excessive Amount of Alcohol Used for its Preparation.*—In the preparation of 1500 Cc. of fluidextract of senna, Edward S. Dawson found it necessary to use 5025 Cc. of alcohol to completely exhaust the senna of odorous, griping, and coloring matter, and 5750 Cc. more of diluted alcohol to exhaust the senna of its purgative constituents, and to finish the fluidextract. In the absence of other criterions, he had to rely upon the freedom from color of the percolates. The product, while free from unpleasant odor, and having a sweetish-bitter taste, is considered rather expensive, the more particularly, because the demand for the syrup, which is directed to be made from it, is infrequent (in his personal experience "nil"). The author admits, however, that he took no steps to recover the alcohol.—Amer. Drugg., Aug. 12, 1907, 70.

*Fluidextractum Thymi Compositum—Formula and Process.*—The following formula for a compound fluidextract of thyme, which in recent years is frequently mentioned as an ingredient in specialties under "New Remedies," is given in "Svensk Farm. Tidskrift":

Herb. thymi .....	250.0 Gm.
Herb. serpyll.....	250.0 Gm.
Fol. castan.....	250.0 Gm.
Flor. rhœad.....	125.0 Gm.
Rad. seneg.....	125.0 Gm.

These ingredients, in cut-up condition, are boiled one hour in 6 kgm. distilled water and the decoction is expressed. The residue is then immersed in 4 kgm. of boiling water; after cooling, 250.0 Gm. alcohol is added, the mixture macerated 24 hours, the liquid expressed and strained. The united press-liquids are then evaporated to one-half their original volume, allowed to settle, and filtered. The filtrate is evaporated to 900.0 Gm., allowed to cool, and mixed with 50.0 Gm. of glycerin and

50.0 Gm. of compound tincture of thyme (which see under "Tinctura.")  
—D.-Amer. Apoth. Ztg., March, 1908, 11.

*Ext. Fuci Vesiculosi Liquidum*—*Estimation of Iodine Content*.—In view of the fact that the efficiency of *Fucus vesiculosus* is understood to depend largely on the iodine and bromine compounds it contains, F. C. J. Bird suggests the following method for determining the iodine in the liquid extract, for which a formula is given in the B. P. C. Formulary: Evaporate a few cubic centimeters of the liquid extract to dryness, and burn at as low a temperature as possible. Treat the powdered residue with a little boiling water, filter, acidify strongly with acetic acid, and add a few drops of solution of peroxide of hydrogen. This liberates the iodine after standing for a short time, and if chloroform be added, the iodine dissolves to a rose-violet solution which readily affords the usual reaction with starch.—Trans. Brit.-Pharm. Conf. (Yearbook of Pharmacy) 1907, 476.

#### GELATINÆ.

*Glycogelatinum*, B. P. C.—*Improved Formula*.—W. J. Uglon Woolcock finds that the glycogelatinum of the recently published "British Pharmaceutical Codex" is too soft for use as a basis for pastiles, that the inclusion of sugar in the formula is unnecessary, and that a definite quantity of solution of carmine should be directed. He recommends the following improved formula:

Gelatin.....	20.00
Glycerin.....	30.00
Distilled water .....	56.00
Orange-flower water (undiluted).....	7.00
Citric acid.....	2.50
Absolute alcohol.....	1.00
Oil of lemon .....	0.20
Solution of carmine.....	1.00

Soak the gelatin in the distilled water until quite soft, add the glycerin, and dissolve by heating on a water-bath. Continue the application of heat until the product weighs 90. Remove from the water-bath, and add the citric acid previously dissolved in the undiluted orange-flower water, the oil of lemon previously dissolved in the absolute alcohol, and the solution of carmine. Mix thoroughly, strain through muslin, and allow to solidify.—Pharm. Journ., Dec. 2, 1907, 813.

*Serum Gelatinæ*—*Formula of the Codex*.—The "Pharm. Weekbl." (1907, No. 33) publishes the following formula of the new French Pharmacopœia for preparing a gelatin solution for the purposes of injection: Gelatin, 10.0; sodium chloride, 7.0; water, q. s. ad. 1000 Cc. The gelatin and salt are dissolved in 500 Cc. of water on the water-bath, the solution is neutralized with  $\frac{N}{10}$  sodium carbonate solution, and brought to the



volume of 1000 Cc. with water. It is then heated 10 minutes in the autoclave at 110° C., filtered into sterilized vials, and these are again heated 15 minutes to 110° C.—Pharm. Ztg., lii (1907), No. 77, 812.

*Gelatina Zinci Oxydati Unna*—*Formula*.—Zinc oxide, 15 p.; glycerin, 25 p.; white gelatin, 15 p.; distilled water, 45 p.

*Gelatina Zinci Oxydati Dura, Unna*—*Formula*.—Zinc oxide, 15 p.; glycerin, 25 p.; white gelatin, 20 p.; distilled water, 40 p.

*Gelatina Zinci Ichthyol, Unna*—*Formula*.—Gelatina zinci oxyd., 98 p.; ichthyol, 2 p.—Pharm. Ztg., lii (1907), No. 53, 555.

### *Glycerita.*

"*Glycetracta*."—*A New Class of Preparations*.—Elaborating and extending the idea conveyed in Mr. Beringer's method for preparing "fluid glycerate of krameria" (which see) to other drugs, W. Harrison Martindale has prepared a line of preparations of the same strength (1:1) as fluidextracts, which have the general advantage of miscibility and compatibility with aqueous vehicles. He proposes for these preparations the class-designation of "*Glycetracts*," and suggests a mode of preparation which is varied to some extent according to the nature of the drug, as follows:

1. For drugs containing water-soluble constituents, bitters, tannin principles, and some flavoring agents:

(a) *Percolation-process*.—For those drugs which will percolate satisfactorily without "blocking" this method is to be preferred. Macerate the powdered drug 100 in glycerin 50 and water 200 for twenty-four hours, then commence percolation. Reserve the first 50 of percolate (this will be found in practice much better than the "60" mentioned in Mr. Beringer's method) and continue percolation with chloroform-water (1 in 1,000) until exhausted. Evaporate the liquor to 50 and add to the reserved portion.

Experiments show that this percolation method is suitable for calumba, cascara (1 per cent. of strong solution of ammonia to be added), digitalis, gentian, hamamelis leaves, krameria, rhubarb, sarsaparilla, senega, taraxacum, valerian, and wild-cherry bark.

(b) *Maceration-process*—i. e., for drugs which will not percolate satisfactorily. Macerate crushed drug 100 in a hot mixture of glycerin 50 and water 200 for six hours, press off and repeat maceration with hot water twice. Combine liquors and evaporate to 100.

Experiments show that this is suitable for chiretta, liquorice (cold maceration), quassia, senna (cold maceration), squills (cold maceration).

### 2. *Alkaloidal Drugs*:

For drugs containing alkaloids it is recommended to percolate, wherever possible, crushed drug 100, with a mixture of glycerin 50, acetic acid 9,

and water 191, and proceed otherwise as under 1 (a), making the final product 100 containing about 3 per cent. of acetic acid.

This method is applicable to aconite, belladonna, cinchona, colchicum, conium, ergot, gelsemium, hydrastis, hyoscyamus, ipecacuanha, jaborandi and nux vomica. The acetic glycerin mixture does its work well, and extracts the bulk of the alkaloids in most cases. The author finds that all the drugs mentioned yield "glycetracts," which are miscible with water to form clear solutions,

*With the following exceptions* : Aconite, catechu, cinchona, coca, colchicum, ergot, hydrastis, krameria, rhubarb and wild-cherry bark. The "glycetracts of some of these drugs can, if preferred perfectly miscible, be replaced by an aqueous extractive, evaporating and mixing a sufficiency of glycerin with the warm liquor. Alkaloidal drugs should, however, be handled by the method given under No. 2, and the fact of these forming opalescent mixtures with water cannot well be obviated.—Chem. & Drugg., Mar. 2, 1908, 489-490.

*"Fluidglycerates"—A New Type of Liquid Pharmaceutical Preparations.*—Some years ago Geo. M. Beringer experimented with a number of the simple bitter and astringent drugs, such as gentian, taraxacum, quassia, krameria, rhus glabra, and white oak, to determine the possibility of preparing a class of preparations of the same drug strength as the tinctures, by substituting glycerin and water for the alcoholic menstruum. He has now carried out this idea practically, for preparations of the drug strength of the official fluidextracts (1 Gm. = 1 Cc.), for which he proposes the class title "fluidglycerates," to distinguish them from the U. S. P. "glycerites," the B. P. "glycerins," and the host of commercial products sold as "glycerates," the following formula for

*Fluidglycerate of Krameria*, is typical for the new preparations :

Krameria, in No. 20 powder.....	1000 Gm.
Glycerin .....	500 Cc.
Water, a sufficient quantity to make.....	1000 Cc.

Mix the glycerin with 2000 Cc. of water, and having moistened the krameria with a portion of this menstruum, pack it in a percolator, pour on enough of the menstruum to saturate the powder and allow it to macerate for twenty-four hours. Then allow the percolation to proceed slowly, pouring on first the remainder of the menstruum and then water until the drug is exhausted. Reserve the first 600 Cc. of percolate and evaporate the remainder to 400 Cc. When cool, add the reserve, and if necessary water, to make the product measure 1000 Cc.

The product is a syrupy liquid of a deep brownish-red color and strong astringent taste. It is miscible with water, forming an almost clear liquid, and has been applied pharmacologically, both in private practice and in hospitals, with gratifying results.—Proc. N. J. Pharm. Assoc., 1907, 56-57.

*Glyceritum Amyli, U. S. P. VIII—Manipulation.*—Edward S. Dawson recommends a return to the manipulation of the U. S. P., 1890, for preparing glycerite of starch, which directed that heat be applied to the mixture of starch, water and glycerin, whereas the U. S. P., VIII directs that the mixture of starch and water be added to the glycerin previously heated to the required temperature ( $140^{\circ}$  C. =  $284^{\circ}$  F.), etc. Under this procedure the water is violently converted into steam, and little balls of ruptured starch granules are formed, which refuse to break down and become homogeneous during the continued heating and manipulation. The product is lumpy and unsightly, whereas by the older method of manipulation the glycerite formed will be perfectly smooth and in proper condition for the intended purposes.—*Amer. Drugg.*, Aug. 12, 1907, 70.

*Glyceritum Tonicum Compositum—Formula.*—F. M. Apple communicates the following formula, which he regards as more correctly representing the original formula of a prominent medical practitioner than any of the formulas that have been published since its introduction as a proprietary preparation. The formula requires a special preparation, which the author designates as

*Gentian Percolate.*—To prepare this, 3 ozs. and 6 drachms of ground gentian are extracted by percolation with sherry wine to make 26 ozs. The formula then is as follows :

Gentian percolate .....	1 oz. 5 drachms.
Sherry wine .....	3 ozs. and 2 drachms.
Fluidextract of taraxacum.....	1 oz. and 6 drachms.
Glycerin. ....	6 ozs. and $\frac{1}{2}$ drachm.
Diluted phosphoric acid .....	2 ozs.
Compound tincture of cardamom .....	1 $\frac{1}{2}$ ozs.
Syrup of lemon .....	3 ozs. and 2 drachms.
Sugar. ....	3 ozs.
Precipitated calcium phosphate...	q. s.

Mix and filter.—*Proc. Pa. Pharm. Assoc.*, 1907, 115-116.

#### INFUSA ET DECOCTA.

*Concentrated Infusions and Decoctions—Non-Reliability.*—G. Frerichs has subjected a number of the so-called concentrated infusions and decoctions supplied by manufacturers to critical examination, and finds that they do not produce, when suitably diluted, preparations that consistently replace the infusions and decoctions prepared in the ordinary way. He, therefore, urges that their use be discontinued.—*Apoth. Ztg.*, xxiii (1908), Nos. 30 and 31, 277 and 284.

*Concentrated Infusion of Buchu, B. P. C.—An Impracticable Formula.*—George Coull points out that the B. P. C. formula for a concentrated infusion of buchu, which is constructed on the general lines for preparing

concentrated infusions, is impracticable, because of the impossibility of expressing any liquid from the mucilaginous mass resulting after macerating the buchu with the specified amount of chloroform water, even if the latter is increased 50 per cent. in quantity.—Pharm. Journ., May 2, 1908, 566.

*Infusion of Quassia, B. P.—Improved Keeping Properties.*—The results of experiments described in some detail have convinced Ernest Quant that the official (B. P.) cold infusion of quassia keeps better than one made with boiling water, but that the present infusion would be improved in its keeping properties if to the official directions were added instructions “to boil for a few minutes and allow to cool.”—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1907, 455-458.

#### LINIMENTA.

*Vasoliments—Improved Method of Preparation.*—After subjecting the formulas and methods for preparing vasoliments proposed by Bedall, Roch, and others, and particularly those adopted by the D. Ap.-V., and that given in Hager's Handbuch, to critical review and experiment, Dr. Hugo Kiehl expresses the opinion that simple admixture of the ingredients in the cold fails to produce satisfactory preparations. It is, to the contrary, essential that the oleic acid and spirit of ammonia be heated until the alcohol and the excess of ammonia is completely volatilized. The vasoliment, while still warm, should not smell of ammonia. If insufficiently heated the vasoliment, although at first clear, becomes turbid again at a comparatively high temperature. Again, if salicylic acid vasoliment is prepared by direct addition of the acid to the simple vasoliment, the acid is sure to be partly deposited again after standing for some time in a cool place. This separation does not occur if the two acids are first heated with the spirit of ammonia and then the paraffinum liquidum is added. On the basis of the observations, the author recommends the following formulas:

*Vasolimentum Salicylicum 10 per cent.*: Acid. oleinic., 200.0; acid. salicyl., 50.0; spir. ammon., 50.0; paraffin. liquid., 200.0. The mixture of acids and spirit is heated 20 minutes, by direct heat, or  $1\frac{1}{4}$  hours on a steam-bath, and the liquid paraffin is then added. The product remains permanently clear at 7° C.

*Vasolimentum Camphoratum 20 per cent.*: Acid. oleinic., 200.0; camphor., 100.0; spir. ammon., 100.0; paraffin. liquid., 200.0. The camphor is dissolved in the spirit of ammonia, the solution heated with the oleic acid 1 hour on the steam-bath, and the liquid paraffin added. Remains clear at 10° C.

*Vasolimentum Ichthyoli 10 per cent.*: Acid. oleinic., 400 Gm., and spir. ammon., 100 Gm., are heated 1 hour on a steam-bath; then 100 Gm.

ammonium-ichthyl sulph. added and the heat continued  $\frac{1}{4}$  hour, before finally adding 400 Gm. of liquid paraffin. This vasoliment also remains clear at 10° C.—Pharm. Ztg., liii, (1908), No. 25, 250-251.

*Camphor Liniment.—Reasons for Variations in Camphor Content.*—The variability of the liniment of camphor or camphorated oil of the B. P. as supplied in British pharmacy, has elicited several papers concerning the causes and the remedies. Alfred Chaston Chapman observes that when properly prepared it contains rather more than 21 per cent. of camphor, but that owing to the comparatively high price of its constituents, it is not infrequently sophisticated either by the complete or partial substitution of cheaper vegetable or even mineral oils for the more costly olive oil, or more generally by reducing the proportion of camphor. Basing his opinion on experience as well as direct experiments, he thinks it may be safely accepted that if camphorated oil is properly prepared in the first instance, and is stored with a reasonable amount of care, the loss of camphor by volatilization will be so small as to be practically negligible.—Bernard Dyer, discussing the fact that the defense set up in prosecutions for selling defective camphorated oil has frequently been based on the assumption that the active ingredients have evaporated during keeping, considers that there is little doubt that when any substantial deficiency in camphor is found it must be attributed either to insufficiency of camphor having been used or to the camphor having been incompletely or unskillfully divided.—Experiments made by E. J. Bevan during the very hot weather in July of 1904, showed that a sample of camphorated oil, originally containing 22.02 per cent. of camphor, after an exposure for three days in an open beaker still contained 21.35 per cent. and had consequently lost only about 3 per cent. of the original camphor content under conditions the most favorable to loss.—Experiments given in some detail by E. F. Harrison point out the importance of care in the preparation of camphorated oil, and the possible deficiency arising from careless or unskillful preparation. The use of heat is not necessary to effect solution if the camphor is in fine powder. But if solution is effected by the aid of heat, in open vessels, and the camphor employed in coarse powder or lumps, the deficiency in camphor content must necessarily be considerable.—Pharm. Journ., July 20, 1907, 68 and 69.

*Camphor Liniment—Estimation of Camphor by Means of the Polarimeter.*—Fred. A. Hund, having satisfied himself that cotton-seed oil shows absolutely no optical rotation, has determined the specific index of rotation in accurately prepared solutions of camphor in cotton-seed oil with the following results :

Per cent. Camphor by Weight.	Reading of Polariscope at Temperature 13° C. (55.4° F.)	Tube Length.	Rotation for 1 per cent. of Camphor.
10 per cent.	+4.92°	100 Mm.	+.492°
10 "	+4.92°	100 Mm.	+.492°
20 "	+9.94°	100 Mm.	+.496°
20 "	+9.90°	100 Mm.	+.495°

These readings show that 1 per cent. of camphor in solution in cotton-seed oil causes an average rotation of 0.493°. Therefore, to get the percentage by weight of camphor in solution in a sample of camphorated oil, divide the reading of the instrument for a tube-length of 100 Mm. by 0.493. If a tube of 200 Mm. length has been used, divide the reading by 2 to get the reading of 100 Mm., and then by 0.493 to get the percentage of camphor.

Comparative experiments gave fairly concordant results with the gravimetric method.—Pacific Pharm., April, 1908, 598, 599.

*Linimentum Saponato-Camphoratum—Improved Formula.*—Fr. Kunze recommends the following formula: 50 p. of stearin and 25 p. of pure sodium carbonate are saponified in a covered iron vessel; the soap is dissolved in 1000 p. of alcohol, by the aid of heat, 30 p. of camphor in 100 p. of alcohol added, and the warm solution filtered in a covered funnel into the stock-bottle. Then 5 p. of oil of thyme, 10 p. of oil of rosemary, and 30 p. of spirit of ammonia are mixed with the filtrate and the mixture is rapidly cooled.—Pharm. Ztg., lii (1907), No. 102, 1059.

*Solid Opodeldoc* and a number of other N. F. preparations are criticised by H. A. B. Dunning, in the "Proceedings" of this Association, 1907, 130–131.

*Liniment of Turpentine, B. P.—Simple and Quick Method of Preparation.*—Wm. A. Knight proposes the following formula and method for preparing liniment of turpentine, B. P., whereby the tedious and troublesome pharmacopœial method is obviated:

Solution of potash B. P. ....	3 fl. ozs.
Oleic acid.....	7 fl. drs.
Oil of turpentine.....	13 fl. ozs.
Camphor... ..	1 oz.
Distilled water sufficient to make .....	1 pint.

Mix the solution of potash with an equal quantity of water in a bottle, — add the oleic acid previously mixed with 3 ozs. of oil of turpentine, and

mix by gently inclining the bottle up and down (violent shaking at this stage produces excessive frothing).—Chem. & Drugg., Nov. 9, 1907, 726.

*Chloroforms of Aconite and Belladonna—Reliability of the "B. P. Codex" Formulas.*—R. Wright calls attention to the advantages of the formulas of the "B. P. Codex" for preparing the chloroforms of aconite and of belladonna. The details of the method for their preparation are as follows :

Aconite or belladonna root, in No. 60 powder.....	100.00
Solution of ammonia.....	25.00
Absolute alcohol	} of each a sufficient quantity.
Chloroform.....	

Moisten the powder with the solution of ammonia and set aside for twenty-four hours. Transfer to a percolator and percolate with a menstruum consisting of one of absolute alcohol to seven of chloroform until 100 of percolate is obtained.

The results of the alkaloid determinations by described methods prove the superiority of the "Codex" process, whether applied to aconite or belladonna root.—Trans. Br. Pharm. Conf. (Yearbook of Pharmacy), 1907, 367-73.

#### LIQUORES.

*Laboratory Test-Solutions—Preservation of Certain Kinds.*—F. H. Alcock makes some practical observations concerning the preservation of certain test solutions, such as albumin, gelatin, starch, etc., which are usually designated to be freshly prepared. To obviate this necessity he has with advantage resorted to a cheap commercial grade of benzene (benzin? Rep.) known as "mineral naphtha," which is described as having a sp. gr. of 0.8706 at 60° F., and an initial b. p. at 140° F., gradually rising to 298°-300° F., when the greatest portion will pass over. If 1 to 2 per cent. is added to gelatin solutions, or to albumin solution as prepared by the B. P. plan, these solutions are well preserved. The mode of action of the preservative is probably the production of an atmosphere inimical to bacterial germs, and, on the other hand, to prevent the oxidizing action of the air.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1907, 398.

*Starch Test Solution, U. S. P.—Modification of Directions.*—Otto B. May recommends that the directions for starch test solution (p. 538, U. S. P.) shall be amended so that on the third line, following 200 Cc., the present text be replaced by : "Then boil a few minutes until a thin transparent fluid is obtained."—Amer. Jour. Pharm., May, 1908, 210.

*Hypodermic Solutions—Sterilization on Prescription.*—Dr. Conrad Stich gives the following explicit directions for sterilizing hypodermic injections at the prescription counter : Place a stoppered vial, a strip of tin-foil and

a parchment label in boiling water, contained in a small enameled vessel, for several minutes. Boil the necessary quantity of distilled water in a test-tube or flask, and add the medicament. The stoppered vial is then removed from the boiling water by the aid of crucible tongs or pincers, previously heated in a flame, the solution is poured into the vial after the edge of its container has been passed through the flame, the tin-foil is placed with the tongs over the mouth of the vial and the glass stopper is inserted into the vial by the aid of the tongs. In the same way the parchment label is then laid over the stopper, and then fastened in the usual manner. Possible alkalinity of the containers must be removed by rinsing with acid before applying them to use. Perfect sterility is thus secured.—Pharm. Ztg., lii (1907), No. 68, 706.

*Sterilized Morphine Solutions.—Method of Insuring Stability.*—Prunier recalls the fact that sterilized morphine solutions are rendered very stable by the addition of a very slight excess of hydrochloric acid. He found such solutions, having acid reactions, to retain their water-bright and colorless condition when preserved in sealed vials (ampuls) for three years, whereas neutral solutions preserved in the same way had acquired a more or less brown color. The presence of the small amount of free acid does not seem to interfere in any way with the use of morphine solutions for hypodermatic purposes, any slight pain occasioned by the acid being probably simultaneously relieved by the morphine.—Pharm. Ztg. lii (1907), No. 89, 932; from Rép. de Pharm., 1907, No. 10.

*Hypodermic Injection of Strychnine Cacodylate and Sodium Glycerophosphate.—Accurately-dosed Preparation.*—E. Baroni recommends the following formula for preparing an accurately-dosed hypodermic injection of strychnine cacodylate and sodium glycerophosphate: Exactly 0.1725 Gm. of pure cacodylic acid is dissolved in 100 Cc. of water; 12 Cc. of  $\frac{N}{10}$  sodium hydroxide solution is added and the volume of the mixture is made up to 200 Cc. Each Cc. of this solution will contain exactly 1 Mgm. of sodium cacodylate. Meanwhile 0.5 Gm. of strychnine nitrate is dissolved in 30 Cc. of boiling water, and the weight is made up to 500 Gm. with pure sterilized glycerin. One Gm. of this solution therefore contains 1 Mgm. of strychnine nitrate. To prepare the solution of strychnine cacodylate 420.5 Gm. of the glycerin solution of strychnine nitrate is weighed off in a tared liter flask; 169.5 Cc of the sodium cacodylate solution is added. Meanwhile 100 Gm. of sodium glycerophosphate is dissolved in 150 Cc. of boiling water, and added to the other solution. The volume is then adjusted, when cold, to 1000 Cc. The solution thus obtained, divided into convenient portions, is then sterilized in an autoclave at 112° C.—Pharm. Journ., Dec. 28, 1907, 849; from Boll. Chem. Farm., 1907, 688.

*Injectio Resorcini Comp.—Unna.—Formula.*—Resorcin, 4 p.; Zinc



sulphocarbolate, 1 p.; Distilled Water, 195 p.—Pharm. Ztg. lii (1907), No. 53, 555.

*Proteid Iron Solutions—Improved and Satisfactory Formulas.*—William H. Harrison criticises the proteid iron solutions of the National Formulary, points out in what respects they are deficient and unsatisfactory, and recommends improved formulas for them. They are here reproduced without further reference to the author's criticisms, which must be consulted in the original:

*Liquor Ferri Peptonati.*

Egg albumen, fresh .....	125 Gm.
Hydrochloric acid .....	15 Cc.
Pepsin .....	1 Gm.
Sol. ferric chloride, U. S. P. VIII.....	60 Gm.
Ammonium hydroxide (= Aqua Ammonia ? Rep.) .....	48 Cc.
Sodium citrate.....	20 Gm.
Alcohol.....	100 Cc.
Aromatic elixir .....	100 Cc.
Tincture vanilla .....	100 Cc.
Angelica wine.....	100 Cc.
Sodium hydroxide.	
Water, of each sufficient, to make .....	1000 Cc.

Dissolve the egg albumen in 2000 Cc. of water, add the hydrochloric acid and the pepsin and digest at 40° C. for six to twelve hours, or until the solution gives no precipitate of albumen on boiling. Filter. Dilute the ammonium hydroxide with an equal volume of water and add the resultant solution to the solution of ferric chloride in small portions, shaking well, and waiting after each addition until the precipitate which is formed is redissolved. When all has been added, dilute to 2000 Cc. Mix the two solutions thoroughly and add sufficient dilute sodium hydroxide solution (25 Cc. official solution to 100 of water) to render the mixture faintly alkaline to sensitive litmus paper. Transfer to a tall cylinder and allow to stand until the precipitated peptonized iron has subsided (over night), then decant off the supernatant liquid and wash repeatedly by decantation with water until the washings give but a faint opalescence with silver nitrate solution. If the precipitate does not settle rapidly or settles incompletely, as often happens, after the slight excess of alkali has been washed out, again render the mixture faintly alkaline. A slight excess of the alkali (about 2 Cc. of 0.5 per cent. NaOH per liter) effects the rapid and complete settling of the precipitate. Transfer to a fine muslin strainer and drain. Transfer the magma to a porcelain dish. Dissolve the sodium citrate in 50 Cc. of boiling water and pour the solution over the magma in the dish. Heat until all is dissolved. Cool and add the alcohol (at this stage the solution measures about 400 Cc., and if filtered and adjusted to 400 Cc. it constitutes the "*Base*" with which the various compound solu-

tions are directed to be prepared by the author? Rep.), aromatic elixir, tincture of vanilla, angelica wine, and enough water to make 1000 Cc. Filter if necessary. The product so obtained is not only claimed to be more beautiful and more palatable than the official N. F. preparation, but one of perfect stability. It is a perfectly clear, claret-colored solution, having a sweetish, faintly aromatic taste, with not a trace of astringency. It contains 0.6 per cent. of iron in place of 0.735 per cent. indicated by the N. F. formula.

*Liquor Ferri Peptonati cum Mangano* may be made with the above mentioned "Base" (which the author designates as "liquor ferri peptonati base" and which he says will keep indefinitely), by dissolving 4.4 Gm. of normal manganese citrate by the aid of 5 Gm. of sodium citrate in 10 Cc. of water, adding this solution to the 400 Cc. of "Base," and then the aromatic elixir, tincture of vanilla and angelica wine, followed by water to make 1000 Cc.

*Liquor Ferri Peptonati cum Mangano et Arseno* is made by the addition of a solution of 0.325 Gm. of arsenous oxide and 0.7 Gm. potassium bicarbonate in 10 Cc. of water to the above preparation, before adding the aromatic elixir, etc., and from this preparation, in turn,

*Liquor Ferri Peptonati cum Mangano, Arseno et Strychnina* may be prepared by adding 0.162 Gm. of strychnine sulphate, dissolved in 5 Cc. water, before adding the aromatic elixir, etc. All these formulas have been thoroughly tried and found to meet the demands for these preparations.

*Liquor Ferri Albuminati* naturally also comes under the author's criticism, which is unfavorable to the N. F. product. The following reconstructed formula yields an acceptable preparation, which has a beautiful claret-red color, and contains 0.6 per cent. of iron:

Egg albumen (fresh) .....	400 Gm.
Solution of ferric chloride, U. S. P. ....	15 Gm.
Ammonium hydroxide (= Aqua Ammoniae ? Rep.) .....	12 Cc.
Alcohol .....	120 Cc.
Aromatic elixir .....	400 Cc.
Solution of sodium hydroxide.	
Water, of each a sufficient quantity, to make.....	1000 Cc.

The author gives explicit directions, which may be condensed as follows: The ammonium hydroxide, diluted, is added to the ferric chloride solution in small quantities at a time, observing that the precipitate is redissolved after each addition; then diluted to 1000 Cc. with water and heated to 50° C. The egg albumen is shaken with a few pieces of glass and 1000 Cc., strained, heated to 50° C. and filtered, with constant stirring into the iron solution. Then dilute sodium hydroxide solution is added, very carefully, so as to produce a mixture *perfectly neutral* to sensi-

tive litmus paper; dilute with 2000 Cc. of distilled water at 50° C., and washed in a tall jar by decantation, with water, until the washings give no reaction with silver nitrate. Any acidity that may develop during the washing, causing the precipitate to settle slowly, must be removed by careful neutralization with dilute alkali. The drained and expressed precipitate is then dissolved in a mixture of 12 Cc. of solution of sodium hydroxide (U. S. P. ? Rep.) and 25 Cc. of water, and the alcohol, aromatic elixir, and enough water to make 1000 Cc., are finally added. The product is clear by transmitted light and very faintly turbid by reflected light.—*Amer. Jour. Pharm.*, April, 1908, 162-170.

*Liquor Ferri Albuminati—Preparation from Milk.*—The so-called "Liquor Ferri Albuminati Drees," a specialty largely exploited in Germany, and to some extent also in this country, has been the subject of repeated experiment and controversy in order to determine the cause of its peculiar milky appearance, while in other respects—iron content and alkalinity—it apparently conformed to the G. P. requirements for liq. ferri albumin. V. Schmatolla has recently expressed the opinion that the turbidity of the preparation is due to an excess of albumen, while the alkalinity remains the same, and this opinion is now confirmed by the experiments of Paul Linckersdorff, who, however, finds that the form of albumen used is not egg-albumen, but simply casein, as represented in ordinary skim-milk. The casein content of such milk is from 3.5 to 5.5 per cent., consequently 1 liter of skim-milk may be substituted for the 35 Gm. of egg-albumen and 1000 Cc. of water directed in the G. P. formula. If the skim-milk is then further treated as officially directed, a solution conforming in general characters to the official liq. ferri albumin. is obtained, which, however, does not resemble the Drees liquor; but if, instead of washing the precipitate (and this is the important point of difference) produced by the addition of ferric oxychloride solution to the milk, the precipitate is simply collected and dissolved in 3 p. of solution of soda and 50 p. of water, the liquor produced will have all the peculiarities that are inherent to liquor ferri albuminati Drees, it being necessary only to increase the final product from 1 liter to 1.33 liters. In short, to make this preparation, egg-albumen cannot be used. Skim-milk is required, and in order to maintain an excess of albumen (casein) the precipitated ferric albuminate must not be washed.—*Pharm. Ztg.*, liii (1908), No. 35, 350.

*Solution of Acid Phosphates, N. F.—An Unsatisfactory Formula.*—Having found some commercial solutions of acid phosphates to contain large, and in some cases, dangerous amounts of "hydrofluoric acid," C. E. Vanderkleed and L. Henry Bernagau made a lot of the liquor phosphatum acidus of the N. F. in order to see whether or not this preparation is less objectionable. The results show that, although practically, free from the objection mentioned, the N. F. formula yields an almost equally objec

tionable preparation, as a dangerous amount of free sulphuric acid passes into the finished product. In the experiment recorded, a preparation of sp. gr. 1.094 was obtained, containing only 8.61 per cent.  $H_3PO_4$ , but also 7.05 per cent. of  $H_2SO_4$ , practically in the free state. The remedy would be to increase the amount of bone-ash by one-third the prescribed quantity. A solution so obtained had the sp. gr. 1.1153, which corresponds well with that given in the N. F. (= 1.113 at 15° C.), and contained 12.713 per cent.  $H_3PO_4$  (free and combined), while  $H_2SO_4$  was present only in traces.—Proc. Pa. Pharm. Assoc., 1907, 107-110.

*Liquor Aluminii Acetici—Rational Process to Secure Stability.*—Albert Sartorius, after a comprehensive review of the numerous criticisms that have appeared from time to time concerning the preparation of solution of aluminum acetate, communicates experiments conducted by him, upon which he bases a rational process for the production of a stable preparation as follows: Dissolve 1000.0 aluminum sulphate in 3000.0 distilled water; triturate 500.0 calcium carbonate with 1500.0 distilled water, and add the mixture to the solution. When the evolution of carbon dioxide ceases, add 1200.0 diluted acetic acid. Manipulating in this way, the carbon dioxide is disengaged in two places, thus obviating a stormy evolution of the gas. Contrary to the general assumption that aluminum hydroxide is produced, on precipitating a solution of aluminum acetate or aluminum sulphate with ammonium carbonate or sodium carbonate, the author proves experimentally and by analyses, that the precipitate uniformly consists of a  $\frac{2}{3}$  basic aluminum carbonate under the conditions mentioned.—Apoth. Ztg., xxii (1907), No. 54, 568-570.

Referring to the preceding paper of Sartorius, of which he speaks commendably, O. Rothe directs attention to the variability of aluminum sulphate in the percentage of water contained in it, which, as already pointed out by Schmatolla, has an influence on the uniformity of the preparation. The quantity directed should be based on anhydrous salt, and the water content of the salt to be used should be exactly defined in the Pharmacopœia.—Ibid., No. 64, 671.

*Solution of Chloride of Antimony—Convenient Formula.*—The extensive use of solution of chloride of antimony in veterinary medicine, and, more recently, the strong recommendation of Unna as a remedy in lupus, makes it desirable to establish a definite formula by which a suitable liquor can be easily prepared at any time. Discussing this question, A. Minto McDonald and J. Rutherford Hill, rejecting the obsolete formula of the B. P. 1885 which has been included in the "Br. Pharm. Codex," state that an admirable preparation may be obtained by the following formula:

Antimonous chloride. ....	132 grains.
Hydrochloric acid, B. P. ....	3 fl. drachms.
Distilled water, to make. ....	1 fl. oz.

This yields a clear water-white solution, having a specific gravity of 1.290. If it is desirable to have a tinted liquor, this is obtained by adding to each fluid ounce about 15 or 20 grains of ferric chloride, whereby the density is raised to about 1.320. If antimonous chloride is not available—though obtainable on the market in a state of purity—the solution may be made from antimonous oxide, as follows:

Antimonous oxide ( $\text{Sb}_2\text{O}_3$ ) .....	84 grains.
Hydrochloric acid, B. P. ....	5 fl. drachms.
Distilled water, to make .....	1 fl. oz.

In either case the liquor can be made in a few minutes, and the strength may be varied to suit the prescriber.—Pharm. Journ., Jan. 25, 1908, 86.

*Liquor Antisepticus, U. S. P., VIII.—Unsatisfactory Flavor.*—Edward S. Dawson says that liquor antisepticus, U. S. P., viii, is not difficult to make, but it is his opinion that it will not become popular with physicians who have used and prescribed some of the well-known antiseptic solutions on the market, until its flavor has been improved by the addition of small percentages of glycerin and oil of gaultheria.—Aug. 12, 1907, 70.

*Liquor Bismuthi, B. P.—Formula.*—In a previous paper Wm. Duncan gave an easy and quick method for preparing a liquor bismuthi, for which he directed 629 grains of bismuth subnitrate and 572 grains of citric acid to produce 20 fl. ozs. of the solution (see Proceedings 1903, 632). Although the method and formula have not been publicly criticised, favorably or otherwise, privately the question has frequently been put: "Can the product be sold as B. P.?" To meet this possible objection Mr. Duncan now submits the following formula and process, which, though not so rapid as the one originally recommended, has the advantage that it gives the official preparation:

Bismuth subnitrate. ....	613 grains.
Citric acid .....	500 grains.
Solution of ammonia, a sufficiency.	
Distilled water to make. ....	20 fl. ozs.

Triturate the bismuth subnitrate and citric acid with one and a-half fluidounces of water, and set aside for two hours. Dilute the mixture cautiously with two and a-half fluidounces of water, and test the solubility of the product by dropping a little of the cream into solution of ammonia. If a perfectly clear solution be not obtained, let the mixture stand, occasionally stirring, until an ammonia-soluble bismuth citrate be the result. Transfer to a filter, wash, and finally dissolve the moist citrate in a sufficiency of ammonia, dilute with water to 20 fluid ounces, and filter.—Pharm. Journ., March 21, 1908, 379.

*Liquor Cresolis Compositus, B. P. C.—Bactericidal Value.*—C. Edward Sage communicates the results of bactericidal experiments made with

liquor cresolis compositus, B. P. C., prepared with different samples of commercial cresylic acid, all of them conforming to the trade description, "water-white," although on keeping some of them commenced to redden. The bacteriological tests were made under exactly the same circumstances, as were the comparative tests with solutions of pure carbolic acid. The results show that, although there is a considerable variation in the bactericidal value of the cresylic acids used, and the liquor cresolis compositus may correspondingly vary in efficiency, the fluid may be worth from  $1\frac{1}{4}$  to  $3\frac{3}{4}$  the bactericidal value of 1 part of pure carbolic acid.—Pharm. Journ., May 30, 1908, 730.

*Liquor Cresolis Glycerinatus*.—*Formula*.—W. J. Uglow Woolcock suggests the following formula as yielding a more satisfactory preparation than the formulas of the U. S. P. or G. P. for the corresponding cresol-soap solutions :

	Parts by weight.
Cresol .....	50.00
Linseed oil.....	18.00
Potassium hydroxide.....	4.25
Alcohol .....	2.00
Glycerin.....	6.00
Distilled water sufficient to make .....	100.00

Dissolve the potassium hydroxide in 20 of the distilled water and make the temperature of the solution  $70^{\circ}$  C. Warm the linseed oil on a water-bath until it reaches a temperature of  $70^{\circ}$  C. Add to it the solution of potassium hydroxide and stir vigorously. Take care that the temperature does not rise above  $70^{\circ}$  C., and stir in the alcohol ; thoroughly incorporate it with the mixture. Remove the stirrer. Continue the gentle application of heat until the oil is completely saponified. Test for this from time to time by dipping a glass rod into the soap and then placing the rod in hot water. The absence of oil globules on the surface of the water indicates the complete saponification of the oil. Stir in the glycerin, add the cresol, and warm gently until all the soap is dissolved. Make the product weigh 100 either by the addition of more distilled water or by evaporation. The preparation contains 50 per cent., by weight, of cresol.—Pharm. Journ., Sept. 7, 1907, 334.

*Liquor Cresoli Saponatus*, G. P. IV.—*Modification of Formula*.—According to a Prussian ministerial ordinance (Oct. 19, 1907), the saponated cresol solution of the G. P. IV is to be replaced by the solution prepared according to the improved formula proposed for the new edition of the G. P. now in course of revision. While in the proposed formula the percentage of cresol is the same as in the present one, the cresol is defined as having the b. p.  $190^{\circ}$ – $204^{\circ}$ , instead of as "cresol. crud.," and the quantity of actual soap is increased—this being effected by reducing the quantity of water for the saponification of 60 p. of linseed oil so as to make

100 p. of soap instead of 135 p. and adding 100 p. of cresol instead of 135 p.—Pharm. Ztg. lii (1907), No. 90, 937.

Discussing the changes in the proposed modification of the G. P. formula for Liq. Cresol. Saponat., indicated in the preceding abstract, Dr. E. Eger considers the new preparation to be fully the equal of the so-called "lysol" as regards its general characters, but superior both to lysol and the present preparation in its disinfectant properties, owing to the specification of cresol having a definite composition. If, however, as may be confidently assumed, the new formula will be adopted in the next edition of the G. P., he considers it important that a method for its examination shall likewise be included. This, he suggests, may be formulated as follows: "If 100 Cc. of the cresol soap are subjected to distillation until the soap begins to decompose, the cr  sol collected under the water, in a graduated receiver, should measure at least 48 Cc.; the cresol, not taking into consideration the first 30 per cent.—which contain water—should distill within the limits of temperature prescribed by the pharmacopœia. One part of cresol soap should form clear solutions with 9 parts of water and 9 parts of benzene. If 5 Cc. of the cresol are diluted to 1 liter with water, no naphthalin flakes should separate within one hour."—Ibid., No. 101, 1049, 1050.

*Solutio Extracti Visci albi Physiologica—Preparation.*—Delassus suggests a solution of mistletoe for hypodermic and intravenous injections, prepared as follows: Infuse 1 Gm. of the powdered leaves three times successively for 12 hours in 65 Gm. of water (as in the preparation of the extract, which see under "Extracta"); evaporate the united and filtered infusions to 50 Cc., add 0.35 Gm. of sodium chloride, filter again, and sterilize it by heating in the autoclave to 120° C. for 20 minutes.—Pharm. Ztg., lii (1907), No. 71, 739; from L'Union Pharm., 1907, No. 8.

*Solution of Ferrous Carbonate—Formula.*—The following formula, modified to make it more available for American pharmacists, is proposed by A. Kal in "Pharm. Weekbl.:"

Iron lactate (powdered).....	25
Potassium and sodium tartrate... ..	28
Potassium carbonate.....	13
Citric acid.....	1
Cinnamon water .....	500
Distilled water, to make.....	1000

Dissolve the potassium and sodium tartrate and the potassium carbonate in about 50 Cc. of distilled water, add the iron lactate and stir until dissolved. Then add the remaining portions of water, and finally the citric acid. The resulting solution is a clear, dark green liquid, that contains approximately 1 per cent. of ferrous carbonate in solution.—Amer. Journ. Pharm., Sept., 1907, 427.

*Solution of Nascent Ferrous Carbonate—Formula.*—M. I. Wilbert mentions that his attention has been directed to a proprietary preparation that appears to offer some advantages, and is certainly more palatable than the solution referred to in the preceding abstract. He finds that a preparation having all the properties of the proprietary article may be obtained by dissolving 3.2 Gm. of granulated ferrous sulphate in 1.5 Cc. of distilled water, diluting with glycerin, and adding 1.6 Gm. of potassium carbonate dissolved in sufficient glycerin to make 100.0 Cc. of solution. Each 5 Cc. of this solution would represent the equivalent of one pill of ferrous carbonate. The solution is clear, transparent and dark green, but decomposes readily when exposed to air and moisture. It should be liberally diluted when administered.—*Ibid.*, Nov., 1907, 525.

*Lime Water.*—A continuous and automatic apparatus for its preparation is described by Otto Raubenheimer, in the "Proceedings" of this Association, 1907, 179-183.

*Solution of Magnesium Citrate.—Preparation.*—Although the subject of "how to prepare solution of magnesium citrate" has been so frequently discussed as to become almost monotonous, the last word has evidently not yet been said. Nor is the subject necessarily devoid of interest, as is demonstrated in a paper read by Mr. Otto Raubenheimer before the N. Y. State Pharmaceutical Association, in which he entertainingly described how he prepares the solution in sight of his customers by making a window display of the operation, this bringing evidence of its freshness "each day" and conviction as to its quality. Incidentally, also, he explains how he economically utilizes the carbon dioxide evolved in the process, which is usually wasted, by conducting it into ammonia water after having first washed it by passage through water. In this way he succeeds in obtaining a supply of crystalline ammonium carbonate, which is readily soluble, stable, and superior in every respect to the official ammonium carbonate.—*Merck's Rep.*, Sept., 1907, 256-257.

*Liquor Potassii Arsenitis—Cause of Variation in Appearance.*—The great variety of colors and differences in appearance of solutions of potassium arsenite obtained by a class of his students, has led Prof. E. Fullerton Cook to investigate the cause of their differences in a solution so simply prepared. He finds that when the compound tincture of lavender is added to the hot solution of potassium arsenite before diluting to the official quantity, the resinous coloring matter, santalin, in the tincture, is precipitated in reddish flakes. This does not occur when the official directions are followed for the preparation of this solution, which may subsequently be even boiled a few minutes without producing precipitation.—*Proc. Pa. Pharm. Assoc.*, 1907, 231-233.

*Solution of Chlorinated Soda (Eau de Javelle)—Action on Glass Containers.*—Referring to the observation of Saur, Kunze and others, concern-



ing the spontaneous fracture of brown (or white) glass bottles used for the storage of solution of chlorinated soda, a correspondent of the "Pharmaceutische Zeitung" (A. M.), mentions that he has noticed the same effect, but that it is not confined in his experience to brown and white glass containers, earthenware bottles being affected in the same way when used for the storage of "Eau de Javelle." He has obviated this disaster to the containers by storing the freshly prepared liquor with the precipitate, in white glass bottles, which are then stoppered with cotton and covered with a loosely fitting glass cap. As required, the solution is filtered into the cork-stoppered store (or cellar) container to the height of two-thirds its capacity.—Ibid., No. 95, 994.

## MISTURÆ.

*Compound Iron Mixture, B. P.—Modified and Improved Formula.*—J. H. Franklin suggests the following modification of the B. P. formula for compound iron mixture, which becomes possible with the use of the "Saccharated Carbonate of Iron," also modified as proposed by him (see under "Pulveres") :

Saccharated Carbonate of Iron .....	16 grains.
Syrup of Glucose .....	3 fluid drachms.
Acacia, in powder .....	20 grains.
Tincture of Myrrh .....	4 fluid drachms.
Spirit of Nutmeg .....	50 minims.
Rose Water .....	a sufficient quantity.

Reduce the saccharated carbonate of iron to a fine powder, triturate with the syrup of glucose and continue the trituration with a few drops of rose water to form a smooth thin paste, gradually add more of the rose water, and add the acacia diffused in the tincture of myrrh and spirit of nutmeg, finally making the product measure 10 fluid ounces with rose water.

This is made in half the time required to complete the B. P. process for compound iron mixture, and the result is a paler emulsion, which does not oxidize nearly as rapidly as the latter.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy) 1907, 438.

*Magma Magnesiae.*—The N. F. formula and process is criticised by Otto Roubenheimer, in the "Proceedings" of this Association, 1907, 150–152.

## OLEA.

*Oleum Benzoinatum (c. resina)*—Unna, is oil (almond?) benzoinated with benzoin (see "Fatty Ointment Bases").

*Ol. Cantharidini, Unna—Formula.*—Dissolve 0.05 p. cantharidin in 5 p. chloroform, add 100 p. expressed oil of almond, and heat the mixture on a steam bath, until the chloroform is evaporated.

*Ol. Gynocardiæ Camphorat., Unna—Formula.*—Oil of gynocardia,

10 p.; stronger (?) camphorated oil (ol. camphorat. fort.), 90 p.—Pharm. Ztg., lii (1907), No. 53, 555.

*Iodo-ferrated Cod-Liver Oil—Cause and Prevention of Darkening.*—According to R. Schultz the darkening of iodo-ferrated cod-liver oil is due to the presence of appreciable quantities of *free* ammonia in the cod-liver oil. Although still experimenting with the object of ascertaining the method best adapted for the removal of the ammonia from the cod-liver oil, he expresses the opinion that treatment with citric acid will effectually accomplish this.—Pharm. Ztg., lii (1907), No. 94, 981.

*Calomel Oil or Cream—Formula for Hypodermic Use.*—E. Dumesnil recommends the following formula for a calomel injection :

Pure precipitated mercurous chloride .....	5.0 Gm.
Sterilized wool fat.....	16.0 Gm.
Liquid paraffin, sufficient to produce .....	100.0 Cc.

Heat the mortar; triturate the calomel with the wool fat; add the liquid paraffin in small portions so as to effect intimate admixture. Sterilize by heating in boiling water or in an autoclave at 120° for twenty minutes. Shake vigorously till cool.—Pharm. Journ., Mar. 23, 1908, 413; from Bull. des Sci. Pharm., 15, 20.

*Oleum Griseum—Formula.*—L. Lafay recommends the following formula for the preparation of the so-called "*huile grise*:" Triturate 40.0 Gm. of purified mercury with 40 Cc. of sterilized anhydrous wool-fat until the globules of the metal are extinguished, then add 57 Cc. of sterilized vaseline oil. The product is to be preserved in a glass-stoppered bottle.—Apoth.-Ztg., xxii (1907), No. 99, 1083; from Journ. de Pharm. et Chim., 1907, ii, 491.

*Adrenine Inhalant—Formula.*—A. Gunn and E. F. Harrison propose the following formula for preparing a stable and elegant oily inhalant of adrenine, containing 1 p. in 1000 p.:

Adrenine. ....	0.10
Absolute alcohol. ....	12.50
Boric acid (free from iron).....	5.00
Hydrochloric acid, a sufficient quantity.	
Eucalyptol. ....	5.00
Oil of gaultheria. ....	2.00
Castor oil, sufficient to produce .....	100.00

Add the adrenine to part of the absolute alcohol, and add to this sufficient of a mixture of hydrochloric acid (s. g. 1.16) with ten times its volume of absolute alcohol to effect solution; then add the remainder of the alcohol and the other ingredients. In solid and semi-solid preparations enough water can be incorporated to carry the adrenine in solution with boric acid, and the use of alcohol is therefore unnecessary. This is illus-

trated in the formulas for *adrenine ointments* and *adrenine suppositories*, which see.—Pharm. Journ., Aug. 31, 1907, 310.

## PASTÆ.

*Unna-Pastes.—Practical Directions.*—Dr. Runge observes that the fats directed in Dr. Unna's formulas for "pastes" must be only such as are benzoinated with benzoin—not with benzoic acid as directed by the G. P. IV. The incorporation of such substances as Kieselgur (Terra Silicea), etc., is best effected in an ointment mill or by the aid of a rolling-machine. Trituration in a mortar will produce a satisfactory product only at the expense of much labor and time.—Pharm. Ztg. lii (1907), No. 53, 555.

*Unna-Pastes.—Formulas.*—The following formulas are communicated by Dr. Runge :

*Pasta Albumin. Alumin.*—*Unna* : Dissolve 17 p. of dry egg-albumin in 70 p. of cold distilled water, and 8 p. of alum in 80 p. of hot distilled water ; mix the two solutions, evaporate the mixture to 87 p., and add, after cooling : Tincture of benzoin, 3 p ; expressed oil of almond, 8 p. ; "Extrait Flieder," 2 p. Then rub the paste through a No. 5 sieve (G. P. = Medium-fine—26 meshes to 1 Cm.).

*Note.*—"Extrait Flieder" is apparently an alcoholic solution of the odorous constituents of elder flowers ("Flieder"), extracted from the so-called "pomade" obtained by the "enfleurage process," Rep.

*Pasta Caustica, Unna* : Dissolve 25 p. of potassium hydroxide in 25 p. of distilled water, and mix the solution with 25 p. each of calcium hydroxide and potash soap (G. P.).

*Pasta Lepismatica, Unna* : Zinc paste (Pasta Zinci Oxydat., Unna) and resorcin, in finest powder, are triturated together to the smoothest possible condition, and then mixed with 10 p. each of ichthyol and vaseline.

*Pasta Lepismatica Mitis, Unna*, is obtained in the same way by the following formula : Resorcin, in finest powder, 20 p. ; vaseline, 20 p. ; ichthyol, 10 p. ; zinc paste, Unna, 50 p.

*Pasta Sulfuris Cuticolor, Unna* : Ichthyol, 2.5 p. ; cinnabar, 2.5 p. ; glycerin, 10 p. ; zinc oxide, 20 p. ; "gelanthcreme Mielk (? Rep.) 25 p. ; precip. sulphur, 40 p.

*Pasta Zinci Oxydat., Unna (Zinc Paste)* : Kieselgur (Terra Silicea), 5 p. ; zinc oxide, 25 p. ; benzoinated oil (ol. benzoin. c. resina, which see under "Olea") 10 p. benzoinated lard (see fatty ointment bases, under "Unguenta"), 60 p.

*Pasta Zinci Comp., Unna* : Zinc paste, Unna ; soft zinc paste, Unna, of each, 50 parts.

*Pasta Zinci Mollis, Unna (Soft Zinc Paste)* : Lime water, linseed oil, of each, 20 p. ; precip. calcium carbonate, zinc oxide, of each, 30 p.

*Pasta Zinci Sulfurata, Unna* (*Sulfurated Zinc Paste*): Kieselgur (Terra Silicea), 4 p.; zinc oxide, 14 p.; precipitated sulphur, 10 p.; benzoinated oil, Unna (see under "Olea"), 12 p.; benzoinated lard (see fatty ointment bases, under "Unguenta"), 60 p.

*Pasta Zinci Sulfurat. Comp., Unna*: Sulphurated zinc paste, soft zinc paste, of each, equal parts.

*Pasta Zinci Sulfurat. Rubra, Unna* (Red Sulphurated Zinc Paste): Cinnabar, 1 part; sulphurated zinc paste, 99 parts.—Pharm. Ztg., lii (1907), No. 53, 555.

*Dextrin Paste—Formula*.—To make an excellent, very sticky and cheap druggists' paste, Prentiss I. Minton mixes powdered yellow dextrin with enough boiling water to make a thin paste, boils the mixture until it clears, and adds a little oil of wintergreen to preserve it. It keeps permanently.—Bull. Pharm., Jan., 1908, 30.

#### PILULÆ.

*New Pill Excipient—Formula for Chemicals Incompatible with Organic Excipients*.—Carles recommends an excipient for pills of drugs having an oxidizing action or otherwise incompatible with organic substances, such as potassium permanganate, gold chloride, silver nitrate, mercuric chloride and iodide, potassium dichromate, etc. The excipient is composed of 2 Gm. of kaolin, 1 Gm. of anhydrous sodium sulphate, each thoroughly pulverized and calcined, and 1 Cc. of water. The two powders and the drug are thoroughly mixed before the water is added. The pills must be made immediately, as the mass remains plastic for only about six to ten minutes, and after a quarter of an hour it becomes very hard. In spite of this it is easily soluble, and will disintegrate after a minute or so in cold water. Carles, who devised this formula, reports that he has found pills made eight years previously to be as easily soluble and chemically as active as when they were made.—Pharm. Journ., April 18, 1908, 578; from Bull. Commerce.

*Pills—Excipients for Salts Prone to Change*.—Carles recommends the massing of pills containing easily decomposable salts, such as silver nitrates, potassium permanganate, gold chloride, mercuric iodide and chloride, etc., by the aid of a mixture of 2 p. kaolin, 1 p. anhydrous sodium sulphate, and 1 p. water. The mass must be mixed carefully and rolled out with celerity, because it remains plastic only a few minutes. The pills, when hard, dissolve with comparative ease in water, and are superior in this respect to pills prepared with kaolin alone.—Pharm. Ztg., lii (1907), No. 102, 1059; from Rép. de Pharm., 1907, No. 11.

*Pills—Manna as Excipient*.—P. Carles recommends manna as an excipient for pills in place of mucilage, etc., which is liable to render them hard and difficult to disintegrate. The manna readily forms a good pill

mass without further addition, which is free from these defects.—Pharm. Ztg., lli (1907), No. 66, 690; from Rép. de Pharm., 1907, No. 8.

*Pills—Ash Percentages and Time Required for Disintegration.*—James Abernethy, after a résumé of the important points in making pills, classification of excipients, etc., gives the following table for the ash percentages found in the pills he used; and a statement of the time required for their disintegration (in water? Rep.) :

	Average Weight of Pill.	Total Ash per Cent.	Per cent. of Ash Sol. in HCl 5 per cent.	Per cent. of ash Insol. in HCl.
	Grains.			
Pil. Rhei Co. (uncoated).....	4.0	3.4	41.5	58.5
Pil. Rhei Co. (pearl-coated).....	6.2	28.0	17.0	83.0
Pil. Coloc. Co. (uncoated).....	4.0	8.5	98.6	2.8
Pil. Coloc. Co. (pearl-coated).....	6.5	39.0	24.0	76.0
Pil. Coloc. Co. c. Hyoscyamo (uncoated)....	4.0	8.0	83.5	16.5
Pil. Coloc. Co. c. Hyoscyamo (pearl-coated).	7.7	44.0	19.0	81.0

Time required for disintegration :

	Uncoated.	Coated.
Pil. Rhei Co. ....	35 minutes.	5¾ hours.
Pil. Coloc. Co.....	30 minutes.	5 hours.
Pil. Coloc. cum Hyoscyamo .....	25 minutes.	5 hours.

—Pharm. Journ., Feb. 8, 1908, 146.

*Pills—Influence of Diluents and Excipients on their Disintegration in the Stomach and Intestine.*—Dr. Ernst Rieben communicates the results of an extensive series of experiments, undertaken with the object of ascertaining the rapidity with which medicaments are absorbed in the human organism when administered in form of pills containing various diluents and excipients. Selecting iodine, in the form of potassium iodide, as the most promising medicament for this purpose, because of the relative rapidity with which it is absorbed in the organism and voided in the urine, in which the iodine is easily and accurately determined, even when present in small quantities, he had pills carefully prepared, each accurately containing 0.02 Gm. potassium iodide, but differing in the nature and kind of diluent and excipient employed to form the mass. These were administered as far as practicable to the same person, after suitable intervals (usually two days) to insure the absence of iodine in the urine from the previous administration, at the same time of day (usually one-half to three-fourths hour after breakfast), and after first emptying the bladder. The urine voided in one, two, three and four hours after the administra-

tion of the dose was then examined, the iodine content determined, and compared with that initially voided under the same conditions after the administration of a dose of 0.02 Gm. potassium iodide in form of aqueous solution. Moreover, the experiment was repeated in each case with identically the same pills, two weeks old, and again after they were two months old. The composition of the different pills thus examined is indicated by the following diluents and excipients employed to form the mass :

(1) Bolus alba and syrup ; (2) Bolus alba and vaseline ; (3) Bolus alba and lanolin ; (4) Bolus alba, glycerin and water ; (5) Medicinal soap and licorice root ; (6) Licorice root and syrup ; (7) Licorice root and mucilage of acacia ; (8) Althæa root and syrup ; (9) Althæa root and mucilage of acacia ; (10) Sugar and mucilage of acacia ; (11) Yellow wax, oil of almonds and starch ; (12) Licorice root and syrup, silver-coated.

The results of the author's investigations are given in a series of 13 tables, exhibiting progressively the quantity of iodine in the urine voided in 1, 2, 3 and 4 hours, respectively, after the administration of the medicament. It is shown in all cases, that the absorption and excretion of the KI from pills were markedly delayed as compared with the results when it was given in form of solution, and that these differences are most marked in the urine voided during the first hour, during which 1.4 Mgm. of iodine was excreted after the administration of KI in solution, whereas, at most, 0.6 Mgm. was excreted after the administration of any of the fresh pills. Indeed, in the case of fresh pills prepared according to formulas 1, 11 and 12, no iodine at all was excreted within an hour after their administration, while in every case after their administration the total quantity was smaller after 4 hours than in the case of solution of the medicament. The delay was most noticeable in the pills made with wax and oil (11) ; those made with sugar and gum-arabic (recommended by Kobert in his "Arzneiverordnungslehre") permitted only a limited absorption of the medicament ; the combination of bolus alba with syrup and with lanolin (1 and 3), gave more favorable results, but with glycerin (4) they were less favorable—although this is recommended in the G. P., IV, and, particularly, by Boehm, in his "Arzneiverordnungslehre" (III, 21). The best results were obtained with licorice root and althæa root (6, 7, 8 and 9)—licorice root and syrup (6) standing at the head—while pills made with soap and licorice root (5) compare very favorably with those belonging to the licorice and althæa group. In general, it may be stated that syrup is superior to mucilage of acacia for massing pills, and that with the age of the pill the delay in its disintegration is more or less increased. A notable exception, however, was found in the case of pills made with bolus alba and vaseline (2), from which more iodine was eliminated after 14 and 65 days than in their fresh state. Finally, it is noteworthy that "*silver coating*" very materially retards the disintegration of pills, this being evident from results obtained with pills (12) prepared

(like 6) with licorice root and syrup, and then coated with silver-foil.—Arch. d. Pharm., 245 (1907), No. 7, 502-517.

*Keratin Coated Pills, Unna—Formula and General Directions.*—Dr. Paul Runge observes that the satisfactory preparation of keratin-coated pills that shall remain intact in the stomach and shall disintegrate and dissolve in the small intestines, depends upon the observance of definite conditions, great care, and a certain experience, while it is practicable to dispense all desirable medicaments in this form, it is of primary importance that the combination of the ingredients be effected in conformity with the formulas given by Dr. Unna, in which, avoiding the additions of vegetable powders as much as possible, the pill mass is formed with a fatty excipient. Unna directs for this purpose a mixture of wax and tallow, designated in his formulas as

*Sebum pro Pilulis Keratina*, which is prepared as follows: Melt together 15 p. of yellow wax and 85 p. of fresh beef suet; add 0.1 p. of cumarin, dissolved in 5 p. of alcohol. Mix and heat the mixture in a steambath until the alcohol is evaporated. The use of this excipient—which may be replaced, however, by woolfat or theobroma oil—and the avoidance of vegetable powders, which are best replaced by white bole, kaolin, charcoal, or kieselgur—has for its object the prevention of the rupture of the pills in the stomach, due to the swelling-up of the constituents. Furthermore, to obviate the undue hardening of the pills, beyond peradventure, Dr. Runge recommends the addition of a little powdered medicinal soap (0.5 = 1.5 per cent.) in all cases of compatibility with the medicament. The pills are coated either with alkaline or acid solutions of keratin, the alkaline

*Ammoniacal Solution of Keratin* being suitable for this purpose in most cases. It is prepared by dissolving 5 p. of keratin (G. P. IV) in 50 p. of ammonia water, filtering the solution and adding 45 p. of diluted alcohol (G. P. IV). In the same manner the

*Acetic Acid Solution of Keratin* is prepared, using glacial acetic acid in place of ammonia water. The pills are coated by moistening them 5-6 times with consecutive portions of the keratin solution after each drying, which is best accomplished in a coating-kettle heated by steam, keeping the pills constantly in motion, and adding each time, when the pills are nearly dry, a little finely powdered graphite, to prevent them from adhering to each other. This is important, for by adhesion the coating is ruptured and the pills become useless for the purpose intended.

*Pilul. Acid. Arsenicos. Kerat., Unna* (0.005 pro dos.): Arsenous acid, 0.5 p. and powdered charcoal, 3 p., are triturated very finely together, 0.5 p. powdered medicinal soap is added, and the powders are massed with "sebum pro pil. kerat.," 6 p. The mass is divided into 100 pills and coated with keratin solution as above explained.

*Pilul Calc. Sulfurat. Kerat., Unna* (0.01 pro dos.): Sulphide of cal-

cium (puriss.), 1 p.; calcium hydroxide, 0.5 p.; precip. sulphur, 1 p.; powdered charcoal, 2.5 p.; "seb. pro pil. kerat.," 5. Make 100 pills and coat them with keratin solution.

*Pilul. Ferri Sesquichlor. Kerat., Unna* (0.03 pro dos.): Dry ferric chloride, 3; kaolin, 5.5; rice starch, 5; powdered med. soap, 1.5; seb. pro pil. kerat., 10. Tinturate the ferric chloride with the kaolin, and the soap with the starch. Mix them, form a mass with the suet mixture, and divide into 100 pills, which coat with keratin solution.

*Pilul. Ichthyol. Kerat., Unna*: (Melt sodium ichthyolsulphonate, 10 p., and yellow wax, 3 p., together and form a mass with kieselgur, 12 p., which divide into 100 pills and coat with keratin solution.

*Pilul. Sapon. Gynocard. Kerat. (Lepra), Unna*: Dissolve 15 p. of gynocardia soap (Mielck) in 10 p. of distilled water and form a mass with 10 p. of seb. pro pilul. kerat. and 5 p. of kieselgur. Divide into 100 pills and coat them with keratin solution.

*Pilul. Sapon. Gynocard. Mitigat. (Lepra) Unna*: Gynocardia soap (Mielck), 10 p., distilled water, 5 p.; seb. pro pil. kerat., 3 p.; sodium ichthyolsulphonate, 3.5 p.; anaesthesin, 1.5 p.; menthol, 0.1 p.; kieselgur, 2 p. Make 100 pills and coat them with keratin solution.—Pharm. Ztg. lii (1907), No. 53, 555.

#### PULVERES.

*Powders—A Combination Divider and Filler.*—J. Percy Remington has devised a combination powder divider and filler. It consists of a brass trough, a cutting frame furnished with 12 spouts and a sectional

FIG. 60.

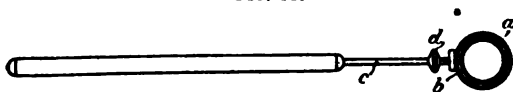
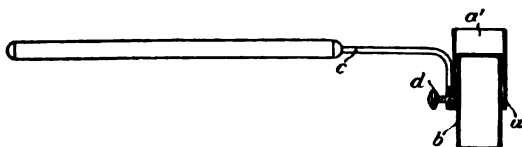


FIG. 61.



Adjustable Powder Measure.

partition for less than 12 powders, and is claimed to deliver the accurately divided portions of powder into machine-folded powder papers. It is operated by distributing and leveling the powder in the trough, placing the cutting frame in it—having previously placed the powder papers over the spouts—then inverting, and tapping with a spatula, which throws

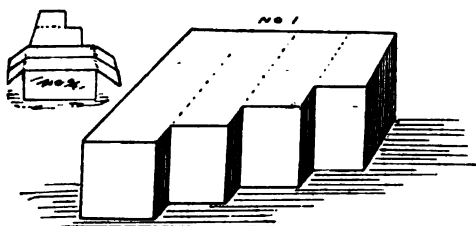


the powder into the folded papers.—Proc. Pa. Pharm. Assoc., 181-183, 1907.

*Adjustable Powder Measure—A New Device.*—Fr. Willie has devised and describes a new form of powder measure which is illustrated by the accompanying cuts, Fig. 60 showing the instrument in flat view and Fig. 61 viewed from the side. It consists of a measuring cup (*a*), attached to the handle (*c*), and is provided with a movable bottom (*b*), which is adjustable to the desired capacity and held in place by the screw (*d*).—Pharm. Ztg., lii (1907), No. 73, 766.

*Powder Folder—Convenient and Simple Form.*—L. W. Marshall describes the simple device for convenience in powder folding, shown by Fig. 62, which is made from a block of wood, by marking off on the block

FIG. 62.



Powder Folder.

the different lengths to correspond with the size of the powder boxes used, and then saw out the notches on the block as in No. 1. The application is shown by No. 2.—Meyer Bros. Drugg., March, 1908, 70.

*Powder Folder—A Convenient Device.*—Attention is directed in "The Apothecary" to the powder folder illustrated by Fig. 63. It is made from two thin pieces of wood, such as a cigar box, a perforated bar being fastened to one of these, as shown, and passing through the other, where it may be adjusted and held in place to accommodate different sizes of powders.—The Apoth., Sept., 1907, 676.

*Cachets.*—A new appliance for filling and sealing cachets is described by Rufus E. Smith, in the "Proceedings" of this Association, 1907, 165-168.

*Dermatological Powders—Dr. Unna's Formulas.*—Dr. Paul Rupp communicates formulas for the following powders prescribed by Dr. Unna in his practice :

---

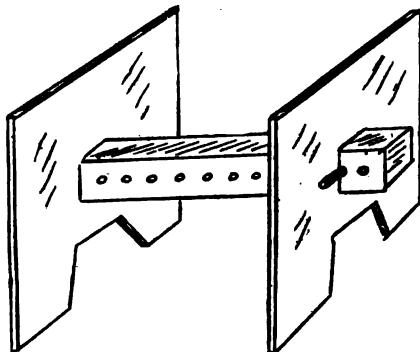
\* The simplest expedient for prescription work is to have powder papers cut of different sizes, the length being scantily twice the length of the powder boxes for which they are intended. By folding these so that the ends will just touch in the center of the fold, they fit uniformly and handsomely, and a superfluous utensil does not encumber the prescription counter.—REP.

*Pulvis Cutifricius, Unna*: Equal parts of powdered marble and powdered medicinal soap are mixed together.

*Pulvis Cuticolor, Unna*: Red bole, 2.5 p.; white bole, 12.5 p.; magnesium carbonate, 20 p.; zinc oxide, 25 p.; rice starch, 40 p. Make a very fine powder (sieve No. 6 = 43 meshes to 1 Cm., P. G. IV).

*Pulvis Cuticolor c. Ichthyol, Unna*: Mix 10 p. of ichthyol and 20 p. of magnesium carbonate by trituration, dry, reduce to fine powder, add 70 p. pulv. cuticolor, and pass the mixed powder through a No. 6 (G. P.) sieve.

FIG. 63.



Powder Folder.

*Pulvis Depilatorius, Unna*: Pure barium sulphide, 45 Gm.; zinc oxide, 27.5 Gm.; rice starch, 27.5 Gm.; oil of lavender, oil of melissa, oil of verbena, of each, 3 drops. Make an impalpable powder (sieve No. 6, G. P. IV).

*Pulvis Stypticus, Unna*: Mix equal parts of tannic acid, alum, acacia and colophonium, all in impalpable powder.—Pharm. Ztg., lii (1907), No. 53, 556.

*Ferri Carbonas Saccharatus.—Prevention of Oxidation during Manipulation.*—In order to prevent the oxidation of the ferrous carbonate, Edward S. Dawson protects the ferrous sulphate and the ferrous carbonate produced from it with plenty of sugar, from start to finish. In making a batch of 200 Gm., for example, 160 Gm. of powdered 4x sugar are added to the ferrous sulphate and thoroughly mixed before dissolving in hot water, and the hot saccharine iron solution is then poured into the solution of sodium carbonate. After the precipitated ferrous carbonate has settled, and the supernatant liquid siphoned off, 160 Gm. of powdered 4x sugar are again added to the precipitate before washing with boiled distilled water, and the same addition is made before each additional washing (usually three more). By this means the iron carbonate is effectually preserved in a ferrous condition. A sample made, assayed 18 per

cent. of ferrous carbonate; after three weeks 15.4 per cent.; and after nearly three years, it still assayed 11.4 per cent. The U. S. P. requires 15 per cent.—*Amer. Drugg.*, Aug. 12, 1907, 69.

*Saccharated Carbonate of Iron—Improved Formula.*—J. H. Franklin recommends the following formula for a saccharated carbonate of iron:

Ferrous sulphate .....	26 oz.
Liquid glucose.....	8 oz.
Sodium carbonate.....	28 oz.
Distilled water boiling, a sufficient quantity.	

Dissolve the ferrous sulphate and 4 oz. of the liquid glucose in 4 pints of the distilled water, and the sodium carbonate in 2 pints of the distilled water; add the former to the latter, stirring constantly, then add 6 pints of the distilled water, mix, cover, and allow the precipitate to settle. Separate the supernatant liquid, twice repeat the process of washing and separation, using 8 pints of the distilled water each time. Mix the precipitate with the remaining 4 oz. of liquid glucose, evaporate on a steam bath as far as possible, dry quickly in a drying chamber, and reduce to a fine powder. So obtained the preparation is quite stable, and keeps well even in partly closed bottles. It contains 66.5 per cent. of  $\text{FeCO}_3$ , whereas the B.P. preparation contains 34.6 per cent. In making tablets, capsules, pills, etc., this difference in strength must of course be taken into account. The author suggests formulas for these.—*Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy)*, 1907, 435-438.

*Ferrum Oxydatum Saccharatum Solubile, G. P.—Necessity of Care and Experience in the Preparation.*—Dr. Hugo Kühl critically reviews the conditions that are responsible for the failure to produce a satisfactory product by the formula of the G. P. IV. for the preparation of soluble saccharated ferric oxide, from which it appears that, aside of the unnecessarily large excess of soda solution directed for the precipitation of the ferric hydroxide, the formation of a product partially or entirely insoluble in diluted acids is due to incomplete washing and to unequal heating of the mass in the steam bath, particularly in the presence of much alkali. The author examined four commercial specimens of the preparation, all of them apparently satisfactory in appearance, and solubility in water. Two of the samples were found to respond in all respects to the G. P. requirements; the third one was incompletely soluble in dilute acids, however, and the fourth one completely insoluble. It is the author's opinion that, while there is no doubt that a satisfactory product can be obtained by the G. P. process, its successful preparation must depend largely upon the individual experience of the operator.—*Pharm. Ztg.*, lii (1907), No. 97, 1014.

*Compound Licorice Powder—Objection to Sweet Components.*—Balmano Squire says that the presence of the sweet components in the compound

licorice powder preclude the use of this most valuable, easy, and harmless laxative by persons affected with diabetes, obesity, gout, and numerous other conditions. His experiments show, however, that the licorice (2 p.) and sugar (6 p.) may be replaced by 8 p. of a powder composed of sweet almonds, blanched, dried and powdered (8 p.) and gum acacia (1 p.). The present title, deriving its name from the licorice contained in the official preparation, would of course be a misnomer for the modified preparation.—Pharm. Journ., March 28, 1908, 411.

*Hydrargyrum Cum Creta*—U. S. P. Tests not too Stringent.—In response to complaints that the U. S. P. tests for *mercurous* and *mercuric* oxides in mercury with chalk are too exacting, Otto B. May examined six original samples of various manufacture. He found that four of these not only complied with the official specifications (employing 0.1 Gm.), but three of the samples gave no reaction when as much as 1 Gm. of the sample was taken. On the other hand, the two remaining samples gave such marked reactions that both the mercurous and mercuric oxides were quantitatively determined: No. 1, contained 1.26 per cent.  $\text{Hg}_2\text{O}$  and 0.22 per cent.  $\text{HgO}$ ; No. 2, no  $\text{Hg}_2\text{O}$ , but 0.093 per cent.  $\text{HgO}$ . The author suggests that the words "If a portion," on p. 241 of the U. S. P., be replaced by "If 0.1 gramme."—Amer. Journ. Pharm., May, 1908, 210-211.

*Scotch Horse Powder*—Formula.—Dr. Mary Emma Doyle says that a preparation made according to the formula here given has proved a very great success as a condition powder. It has a powerful diuretic and antispasmodic action, and usually proves efficacious if administered at a time when a horse has been taken suddenly or violently ill. Moreover, given at intervals (usual dose one teaspoonful), it will keep horses in good condition. The formula is as follows:

Peruvian bark .....	2 ounces.
Hydrastis .....	2 ounces.
Sassafras .....	2 ounces.
Fenugreek .....	2 ounces.
Capsicum .....	2 ounces.
Black antimony .....	2 ounces.
Lobelia seed .....	$\frac{1}{2}$ ounce.
Ginger .....	8 ounces.
Oil of amber .....	1 ounce.
Oil of juniper .....	2 ounces.
Spirit of nitrous ether .....	2 ounces.
Haarlem oil .....	2 vials.

Mix the powders thoroughly, and pass them through a sieve. Mix the liquids and gradually incorporate them with the powder. Keep in glass; dispense in tins.—Drugg. Circ., Jan., 1908, 9.

## RESINÆ.

*Medicinal Resinoids—Necessity of Adding Extraneous Matter.*—D. B. Dott, using the word "resinoid" as applicable to euonymin, gelsemin, hamamelin, hydrastin, iridin, leptandrin, and the like, discusses the practice of adding certain extraneous matter (both organic and inorganic) to these preparations, with the object of their preservation. He concludes that, although there is a disposition to regard these added matters as adulterations, they are without doubt in the main justifiable additions, and he points out the expedients that must be resorted to in some instances to produce and maintain these resinoids in a presentable form and condition.—Trans. Br. Pharm. Conf. (Yearbook of Pharmacy), 1907, 468-470.

*Jalap Resin—Criticism of the Pharmacopœial Tests of Identity and Quality.*—Dr. Deér reviews the deficiencies of the G. P. IV tests for the identity and quality of jalap resin, which have been substantially followed in most of the pharmacopœias, and describes the experiments which have led him to suggest the following official requirements:

If 1 Gm. of the powdered resin is shaken frequently during 6 hours with 10 Gm. of alcohol-free ether in a well-closed flask, the solution then filtered into a tared flask, the undissolved portion and filter washed three times with 5-6 Cc. of ether, and the united solutions evaporated in the water-bath, the residue, after drying at 100° C., should not weigh more than 0.1 Gm., and *should be insoluble in ammonia solution*, even when heated.

If the portion insoluble in alcohol-free ether, after drying in the water-bath, is heated in a well-closed flask to 30°-40° C. with 5 Cc. of ammonia water, it should form a clear solution, which, after dilution with twice its weight of water and addition of acetic acid in excess, should not become turbid until after prolonged standing.

If 0.02 Gm. of jalap resin is dissolved in 2 Cc. of acetic acid anhydride and a few drops of concentrated sulphuric acid are added, the mixture should not acquire a rose color (absence of colophonium) nor a dirty green color (absence of guaiac resin).—Apoth.-Ztg., xxii (1907), No. 80, 862-864.

## SAPONES.

*Medicinal Soaps.—Efficient Substitute for Eunatrol, etc.*—According to H. Senator, pills of soap efficiently replace the so-called "Eunatrol" (see Proceedings, 1902, 702) and other gall-stone remedies. He recommends the following formula: Sapo. medicatus, 10-12-15.0; mucilago, gummi arab., q. s. f. pil. No. 100. Consp. cort. cinnamoni. Dose: 3 pills 3 times daily. These are well tolerated if taken shortly after meals, and while their remedial effect in gall-stone affections is not certain, it is not inferior to that of other internal medicaments.—Pharm. Ztg. liii (1908), No. 13, 132; from Therap. d. Gegenw. 1908, No. 1.

*White Castile Soap vs. Coconut Oil Soap.—Objectionable Distinctions.—*

D. B. Dott points out that, although successive editions of the B. P. have ordained olive oil and soda as the material from which *Sapo durus* (Castile Soap, B. P., 1885) is to be prepared, it is very evident from authorities which bear upon the subject that whatever may have been the practice in the past, castile soap of unexceptionable quality and composition is now largely prepared wholly or with the addition of other vegetable oils. Indeed, this is admitted even by the older authorities, and going back as far as Rennie's "Supplement" (18th Century), the following definition is given: "*Sapo durus*, hard soap. *Sapo hispanicus*, Spanish or castile soap, alicant soap, Venice soap. All hard soaps are made of different proportions of barilla and vegetable oil, chiefly olive oil." Coming to the modern practice, Mr. Dott is informed by a soapmaker that refined cotton-seed oil yields as good a soap in every respect as olive oil, and there is no chemical reason why it should not. It has been so long customary to use other oils than olive, and the fact is so well known, that we must regard the custom as permissible when the product is satisfactory. The case is entirely altered, however, when *coconut oil* has been used. This oil gives a very white soap, which makes a pretty soap powder; but it is not so good a soap as a true castile. Chiefly on account of the large amount of laurate of soda in its composition it is more readily hydrolyzed by a small addition of water (as shown by Thompson and Wright and others). Consequently, when moistened and rubbed on the skin, the greater amount of free alkali is apt to cause irritation. Another point is that a coconut-oil soap takes up more water, without appearing to have it, than does *sapo durus*, so that one would be likely to get less soap for his money than when receiving a genuine castile. Lastly, when made into a spirituous liniment a slight but objectionable odor is apt to be developed, presumably from the formation of an ester of an acid derived from the coconut oil.—Chem. and Drugg., April 11, 1908, 565.

*Medicated Soaps—Formulas by Dr. Unna.*—Dr. Paul Rupp communicates the following formulas for a number of medicated soaps presented by Dr. Unna in his practice:

*Sapo Cutifricius, Unna*: Superfatted potash soap (Beiersdorf), 45 Gm.; powdered pumice, 45 Gm.; "Gelanthcreme (Mielcke)," 10 Gm.; oil of verbena, oil of lavender, of each, 5 drops; oil of orange flowers, 1 drop. Mix. Dispense in tubes.

*Sapo Glycerini C. Vitelli Ovi, Unna*: Egg-yolk, 15 Gm.; liquid glycerin soap, 80 Gm.; glycerin, 5 Gm.; oil of verbena, 3 drops.

*Sapo Thiosinamin. Unguinos., Unna*: Triturate 5–10 p. of thiosinamin finely with an equal weight of water, and add sufficient superfatted potash soap (*sapon. kalin. adipos.*), Beiersdorf, to make 100 parts.

*Sapo Tuberculin. Unguinos., Unna*: Mix 5 p. of tuberculin (Koch)

with 95 p. of superfatted potash soap (Beiersdorf).—Pharm. Ztg., lii (1907), No. 53, 556.

*Medicated Soaps—Formulas.*—W. Hanauer communicates formulas for a number of infrequently prescribed medicated soaps, which deserve consideration, since the author is a practicing physician and evidently thoroughly conversant with their manufacture. The bases required for these medicated soaps are: I. The neutral, solid soap of commerce; II. Superfatted soap, obtained by mixing neutral soda soap (from tallow) with 20 per cent. of oleic acid and 3 per cent. of lanolin; III. Alkaline soap base, obtained from dry soda soap by the addition of 2.5 per cent. each of calcined soda and potash. For the preparation of the medicated soaps, these several soap bases may be used either in pieces or powdered, the latter being preferable because of the ease with which the powdered soap may be mixed with many of the medicaments, and because the latter are less liable to decomposition than when incorporated with hydrous solid soap.

*Chlorinated Lime Soap* is made with neutral soap, in powder, and 10 per cent. of chlorinated lime.

*Pine-needle Oil Soap* with 10 per cent. ol. pini silvestris.

*Iodine Soap* is made with superfatted soap, either solid or powdered, and 2 per cent. of iodine, and is said to keep well for some time.

*Cantharidin Soap*, in neutral soap with 0.2 per cent. of cantharidin.

*Menthol-Eucalyptol Soap*, is neutral soap with 3 per cent. menthol and 5 per cent. eucalyptol.

*Naphthalin Soap* is composed of powdered soap and 5 per cent. naphthalin.

*Rhubarb Soap* contains 5 per cent. of alkaline alcoholic extract of rhubarb; a mild substitute for chrysarobin soap.

*Salicyl-Ichthyol Soap* contains 2 per cent. salicylic acid and 6 per cent. ichthyol.

*Salol Soap* contains 5 per cent. salol in neutral soap base.

*Sublimate-Sodium Chloride Soap*, neutral powdered soap, containing 2 per cent. of corrosive sublimate and 1 per cent. of sodium chloride, the latter having the effect of retarding the decomposition of the mercuric chloride for a long time.—Pharm. Ztg., liii (1908), No. 13, 132; from Siefenfabrikant.

*Liquid Soap.*—An economical formula is given by M. I. Wilbert in the "Proceedings" of this Association, 1907, 119-120.

*Liquid Soap—Formulas.*—I. V. Stanislaus suggests the following formulas for preparing acceptable liquid soaps:

## FORMULA NO. 1.

Take of linseed oil .....	300.0 Gm.
Place in a strong and capacious bottle and add a solution of potassium hydroxide (U. S. P.).....	61.0 Gm.
In a mixture of	
Alcohol .....	100.0 Gm.
Water, distilled. ....	150.0 Gm.

Agitate the mixture vigorously during the twenty-four hours, or until completely saponified.

Mix this product with

Alcohol. ....	200.0 Gm.
Water, distilled .....	200.0 Gm.
And perfume with	
Ol. bergamot,	
Ol. orange,	
Ol. cassia,	
Ol. spearmint, of each. ....	2.0 Gm.

## FORMULA NO. 2.

Take of potassium carbonate.....	120 gra.
Dissolve in dilute alcohol .....	12 fl. ozs.
And add soft soap, U. S. P.....	6 ozs. av.
Digest this in a warm place over night, then add dilute alcohol to make .....	32 fl. ozs.
After standing 24 hours filter and add	
Soluble blue.....	2 gra.
Ol. cassia,	
Ol. lavender of each .....	30 M.

This formula produces a light greenish-colored soap.—Proc. Pa. Pharm. Assoc., 1907, 154.

## SPIRITUS.

*Spirit of Camphor*.—A simple method for the estimation of the camphor and alcohol in this preparation is given by James Seymor in the "Proceedings" of this Association, 1907, 443-444.

*Spirit of Camphor—Estimation of Camphor*.—Theo. D. Wetterstroem recommends the following method for the estimation of camphor in the spirit:

Ten Cc. of spirit of camphor is pipetted into a 100-Cc. cassia bottle and saturated salt solution added to almost the shoulder and the bottle is well shaken. The camphor is thrown out of solution and is seen floating on the surface. Two Cc. of ether are added and the camphor dissolved by gentle rotation. Enough salt solution is now added to bring the liquid up in the neck of the bottle, and the volume of ether solution is carefully noted. One Cc. of this ether solution is then pipetted out into a large watch crystal, and the ether allowed to evaporate spontaneously or by



gentle fanning. The crust of camphor is then rubbed with a glass stirring-rod until it is in a pulverulent condition and is free from apparent moisture. The weight is then taken, which remains quite constant for a few minutes. From this weight of camphor the total amount of camphor is calculated in the total volume of ether solution, and this multiplied by ten will be the amount of camphor in the 100 Cc. of spirit. It has been found by experiment that about ten per cent. of the weight of camphor present is lost by evaporation or remains in solution. Hence, for correction, add ten per cent. of the weight of the camphor recovered for the true camphor content. This weight will check the rotation on polariscope method.\*—Midland Drugg., Nov., 1907, 212.

*Spirit of Nitrous Ether—Practical Utility of the U. S. P. VII Process.*

—Professor Francis Hemm practically demonstrated the utility of the process of the U. S. P. VII for preparing spirit of nitrous ether. This process is a slight modification of the process of Dr. Dunstan for preparing ethyl nitrite, and with ordinary care is so easily carried out by the pharmacist that there remains no excuse for not attempting and satisfactorily preparing it. There is a theoretical quantity of ethyl nitrite to be obtained, and the practical quantity obtainable; we should get about 60 Gm. of washed nitrite, which is to be diluted with 22 times its weight of alcohol. In practice we get somewhat less; but even with this loss, the preparation by the pharmacist becomes profitable, and, above all, the satisfaction of knowing that the spirit is prepared in accordance with the pharmacopœial requirement. Professor Hemm pronounces the process as being the simplest and the product the best that has been proposed.—Proc. Mo. Pharm. Assoc., 1907, 107-109.

*Spirit of Nitrous Ether.—Variability of the Commercial Product.*—

Mrs. D. W. Whitney reports the results of the assay of seventeen samples of spirit of nitrous ether purchased from different drug stores. The lowest percentage of ethyl nitrite found was 0.570 per cent. the highest, 3.910 per cent.; the average for the seventeen samples, 1.8314 per cent. (The U. S. P. requirement demands not less than 4 per cent. Rep.). From information obtained the deficiencies of the samples are due: 1st, to omission of proper chilling of the conc. nitrous ether and alcohol before mixing; 2d, to simply pouring the conc. nitrous ether into the alcohol, without guarding against loss by vaporization; 3d, to improper preservation, exposure to light, air, etc.—Proc. Mo. Pharm. Assoc., 1907, 148-149.

*Spiritus Argenti Nitrici, Unna.*—*Formula*: Dissolve 5 p. of silver nitrate in 7.5 p. of distilled water and add 87.5 p. of spirit of nitrous ether.

*Spiritus Capillaris, Unna.*—Castor oil, 2 p.; resorcin, 5 p.; cologne water (spir. coloniensi), 50 p.; alcohol (95 per cent.), 143 p. Mix.—Pharm. Ztg. lii (1907), No. 53, 556.

---

\* See, also, "Camphor Liniment."—REP.

## STILI.

*Stili—Dr. Unna's Formulas.*—Dr. Paul Rupp communicates the following formulas for medicated pencils prescribed by Dr. Unna in his practice :

*Stili Alcoholis, Unna:* Powdered stearin soap, 6 p., and glycerin, 2.5 p. are dissolved in alcohol (95 per cent.), 91.5 p. with the aid of heat, and poured into tin sliding boxes of suitable form.

*Stili Resinosi, Unna:* Melt 1 p. of yellow wax and 9 p. of rosin together and pour the melted mixture into cylindrical molds.

*Stili Unguinosi, Unna:* These are prepared with a mass obtained by melting 30 p. of yellow wax and 70 p. of anhydrous woolfat together. The medicament desired is incorporated with this mass, while in a liquid condition, the mixture stirred until it has cooled sufficiently, and is then poured into tin moulds of suitable form.

*Stili Unguinosi Chrysarobini 30 per cent., Unna:* Finely pulverized chrysarobin, 30 p.; yellow wax, 20 p.; anhydrous woolfat, 50 p.—Pharm. Ztg., lii (1907), No. 53, 556.

*Colored Marking Pencils.—Method and Formula for Preparation.*—The following method for preparing marking pencils in different colors is given in "N. Erf. u. Erfahr.:" 4 p. ceresin 3.5 p. carnauba wax and 2.4 p. Japan wax, are melted together; 5 p. talc is then stirred in, followed by the desired coloring material (all of these, of course, in fine powder), in the following quantities: Prussian blue, 1.25 p.; cinnabar (imitation), 1.5 p.; chrome-green, 1.5 p.; zinc-white 1.5 p.; chrome-yellow, 1.5 p.; or lamp-black, 0.8 p. The heating is continued during half an hour on a boiling water bath with uninterrupted stirring, and the mass then poured into glass tubes, 25 Cm. long, closed with a cork at one end, and allowed to cool. The congealed cylinders may then be removed, and the hollow portion, which inevitably forms, cut off, to be included in subsequent operation.—Pharm. Ztg. lii (1907), No. 77, 812.

## SUCCI.

*Fruit Juices—Prohibitory Decisions Regarding Salicylic Acid as Preservative.*—In view of the conflicting opinions expressed by competent authorities concerning the admissibility of salicylic acid as a preservative of fruit juices, which has for years been a subject of controversy, the question had been referred in 1904 to the Prussian Scientific Deputation of Medical Administration, and decided unfavorably to the use of salicylic acid for this purpose. This decision has since been criticized by Filehne, Blumenthal, Ehrmann and others; but this is now again confirmed by a recent decision of the same deputation (Jan. 9, 1908), on the ground that the use of salicylic acid for the preservation of fruit juices is not essential, and that in consequence of the changes which occur in salicylated fruit

juices, the definition "adulterated" as applied to fruit juices so preserved, is perfectly justified.—Pharm. Ztg., lii, (1908), No. 21, 213; from Ministerial-Bl. f. Med. Wis., 1908, No. 5.

*Concentrated Fruit Juices.—Industrial Production and Characters.*—The process devised by Dr. O. Volz for the preparation of concentrated fruit juices, described in last year's report (see Proceedings, 1907, 688) is now practically applied on an industrial scale, the products being placed on the market under coined names indicative of the fruit—such as "Sucrubid" for concentrated raspberry juice, "Fragarid" for strawberry juices, etc. A. Röhrig has subjected these new products to examination, and characterizes them as black-brown syrupy and viscous aromatic liquids. The aroma is so concentrated that, similar to the concentrated perfumes, it requires dilution before it becomes agreeable. A dilution of "sucrubid" 1 : 20, converted into syrup in the proportion of 7 : 13 with sugar, furnished a faintly colored raspberry syrup, which, although responding to all requirements from the chemical standpoint, did not have the full flavor demanded of a pure raspberry syrup. Nevertheless, it is believed by the manufacturers that these concentrated fruit juices will prove useful as a flavor for confectionery, soda water and other alcohol-free beverages, and particularly for export to the tropics, for which they are eminently suited on account of their stability. Moreover, their stability may be further enhanced by the addition of alcohol with which they form clear mixtures in all proportions.—Pharm. Ztg., lii (1908), No. 25, 251; from Ztschr. f. Unters. d. Nahrungsm., 1908, No. 3.

*Lemon Juice.—Extraction by a Process of Centrifuging.*—E. Stock directs attention to an improvement which has been introduced by several Sicilian manufacturers of lemon juice, which consists in applying the process of centrifuging to the extraction of the juices from lemons. In this way it is obtained comparatively free from the extraneous and objectionable extractive matter, such as the bitter substance of the seeds which is liberated by the crushing process to which the fruits are subjected by the older methods of extraction.—Pharm. Ztg., lii (1908), No. 48, 477; from Chem. Ztg., 1908, No. 39.

## SUPPOSITORIÆ.

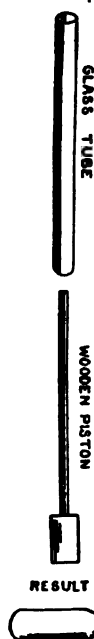
*Suppositories.—Addition of Petrolatum.*—C. K. Bushey observes that in making suppositories containing a granular powder, much difficulty is experienced in rolling and shaping the mass. The suppositories tend to crumble, especially when they become too cold. This difficulty can be overcome by adding two grains of petrolatum to each suppository. T. T. Lane finds the addition of a little petrolatum to the grated cacao butter to facilitate the formation of a plastic mass, which can be easily worked and shaped by hand, and is preferable, on a hot day, to mixing the melted fat with the ingredients in the customary manner. For dusting the sup-

positories when rolling them out he uses wheat flour, which gives them a much neater appearance than dry lycopodium.—Bull. Pharm., Aug., 1907, 338.

*Suppositories—Addition of Lanolin.*—Charles Keller finds that in making cacao-butter suppositories by the cold process, the addition of lanolin results in a better working mass than can be obtained by the addition of castor oil or glycerin.—Ibid., Sept., 1907, 378.

*Suppository Mould—A Cheap and Convenient Device for Compression.*—

FIG. 64.



G. A. Ramsden has devised a suppository mould, the several parts of which are illustrated by the accompanying drawing (Fig. 64), although not in exact proportions. A piece of glass tubing with a (uniform) bore of one-fourth inch and about four or five inches long is rounded in the alcohol flame on the cut edges; a piston, with a plunger just the size of the tube, is made of wood, and the apparatus is complete. In use the same method is employed as in filling capsules; the tube is pressed into the material until a certain (required) portion is taken up. The plunger is then inserted, the material is compressed, and the compressed cylinder forced out. On rounding one end in a bullet shape the suppository is complete.—Bull. Pharm., Sept., 1907, 378.

*Suppository Mould—Extemporaneous Device.*—Luther Marshall suggests paper moulds for preparing suppositories by the milling process. These are made by wrapping wax or oil paper (or better, tin-foil? Rep.) around a "mould-stick," trimming to proper size, and placing in a rack, as shown by Fig. 65, when they may be filled with the suppository mass, in a suitably molten condition, and chilled.—Bull. Pharm., Jan., 1908, 30.

*Suppository Mould. Glycerin Suppositories—Modification for Stock Quantities.*—

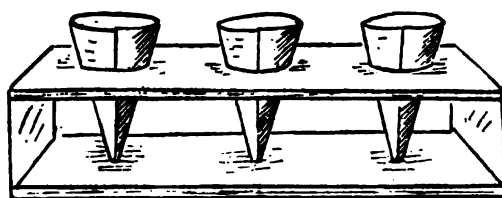
H. C. Blair finds that the U. S. P. formula for glycerin suppositories is quite satisfactory for their extemporaneous preparation; but if they are prepared in quantities for stock, a superior article can be made by adding to heated glycerin three per cent. of soap made from stearin and sodium carbonate. This soap should be as nearly neutral as possible, and dried and powdered. The advantages over the official suppository are a lower melting-point, greater solubility and firmer consistency. If kept in well-stoppered vials, and in a moderately cool temperature, they retain their perfect condition almost permanently.—Proc. Pa. Pharm. Assoc., 1907, 156.

*Adrenine Suppositories—Formula.*—A. Gunn and E. F. Harrison propose the following formula for preparing adrenine suppositories, which are stable and elegant, and contain 1 p. of adrenine in 1000 p.:

Adrenine .....	0.10
Boric acid .....	0.20
Water.....	3.00
Anhydrous woolfat .....	10.00
Oil of theobroma, sufficient to produce.....	100.00

Dissolve the boric acid in the water, then add the adrenine and dissolve; mix the solution with the woolfat by trituration, and add with constant stirring to the theobroma oil previously melted at a low temperature.—Pharm. Journ., Aug. 31, 1907, 810.

FIG. 65.



Suppository Mould.

*Iodoform Bougies—Formula.*—A committee of the Congress of Pharmaceutical Chemists at Milan recommends the following formula for iodoform bougies for inclusion in the Italian Pharmacopœia: Collæ piscium (Isinglass), 6.0; aqua, 20.0 Gm.; glycerin, 3.0 Gm.; iodoform. pulv., 11.0 Gm. The isinglass is dissolved in the water in a tared capsule on the water-bath, the glycerin is added, and the solution evaporated to 23 Gm. The iodoform is then incorporated, and the mixture poured into glass-tubes, 5 Mm. in diameter, and rapidly chilled. The bougies are preserved in lycopodium.—Pharm. Ztg., lii (1907), No. 102, 1059; from Rép. de Pharm., 1907, No. 11.

*Ichthyol Pessaries—Solubility*—It has been stated that ichthyol pessaries, made with a glycerin-gelatin base, become insoluble. Robert R. Hallaway now records experiments, extending over the years 1904-1906, which show that pessaries made with ichthyol, 10 per cent., and glycerin suppository mass (glycerin-gelatin), 90 per cent., retained their solubility in warm water at a temperature of 93° F. to 96° F., perfectly to the present day. The glycerin-gelatin was made both with the finest French gelatin and, as an experiment, with gelatin of a low quantity, without any perceptible effect on the solubility of the pessaries. Even pessaries, submitted to the author for experiment, which had become so hard that they required a hammer and chisel to divide them, became softened on immersion in cold water and swelled out to a regular shape, and, after 48 hours, were found quite soluble in water at 96° F.—Pharm. Journ., May 2, 1908, 567.

*Ichthyol Pessaries—Preparation, Melting-Point, Etc.*—George Roe, discussing the preparation of pessaries of ichthyol with gelatin bases,

states that the B. P. suppository of glycerin has secured well-deserved recognition in the new edition of the "Pharmacopœia of the Hospital for Women," London. In making suppository of glycerin about 15 per cent. of water is retained by the gelatin after it has been evaporated to a given weight, and any attempt to make the mass by dissolving the gelatin in this amount and thus avoid evaporation is a difficult operation; hot water and warm glycerin should be used. Such a process is not suitable for large quantities. The finished pessary may be considered to contain:

Ichthyol .....	10
Glycerin .....	60
Gelatin .....	16
Water .....	14

Experimenters conclude that the melting-point is somewhere about 100° F., but it must not be considered such a fact bears much relationship to the conditions under which the pessary does its useful work. It remains in situation usually about twelve hours, and is certainly not so stationary as when its melting and fusion points are being ascertained. Although of opinion that glycerin suppository is the most reliable formula for making the pessary of ichthyol, it is more difficult to make than some of those used on the Continent, but the latter are only suitable for pessaries for immediate use.

	French Grammes.	Italian Grammes.	German Grammes.
Gelatin .....	11.0	9.25	11.0
Glycerin .....	72.6	66.6	70.0
Water .....	16.3	25.0	10.0

They all contain less gelatin than the glycerin suppository, consequently it is possible to make them without evaporation. The most permanent is the first, and can be used in such quantities as frequently occur in ordinary prescriptions. In many pharmacies in France and Italy the mass is kept ready-made and used as required. The best result is obtained by soaking the gelatin in the water a whole night. It gives time for the hard curled edges to soften, and forms a clearer solution when heated on the water-bath. This also would be an improvement in making glycerin suppository.—Pharm. Journ., May 9, 1908, 594.

*Massa Urethralis, Unna—Formula.*—Powdered turmeric, 5 p.; balsam of Peru, 2 p.; oil of theobroma, 100 p. Digest for 2 hours in the steam bath; then filter.

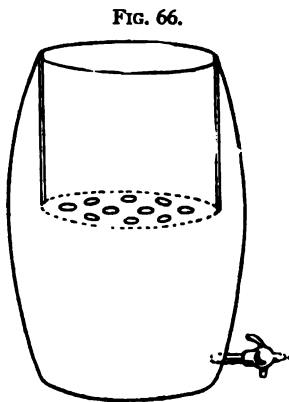
*Massa Urethralis c. Argento Nitr., Unna—Formula.*—Silver nitrate, 1

p.; dissolve in distilled water, 1 p.; add the solution to 98 p. massa urethralis, previously melted in the steam bath, and shake the mixture until cool.—Pharm. Ztg., lii (1907), No. 53, 555.

## SYRUPS.

*Aromatic Syrups.—Direct Extraction of the Drug with Syrup.*—Mentioning the fact that of the ten syrups of the B. P. which may be described as “aromatic,” seven are flavored wholly or mainly by the addition of alcoholic tinctures, D. B. Dott points out that of the other three, two are made by extracting the drug with water, but not one is prepared by extracting the aromatic and flavoring principles by means of simple syrup. In the older pharmacopœias (London and Edinburgh), as also in their compendium, the aromatic drugs are likewise uniformly extracted by water and the sugar dissolved therein afterwards. None of the syrups seem to have been made with tinctures, although there is an interesting note in Renwïe’s “Supplement to the Pharmacopœias” (1826) under *syrupus toltanus*: “Imitated by adding tincture of tolu to simple syrup, and the imitation is as good as the genuine and more easily made.” Mr. Dott’s object in the present paper is particularly to call attention to the value of simple syrup, used wholly or in part, for the direct extraction of the aromatic principle of drugs with aqueous media. Ginger is a conspicuous instance. Both the gingerol and the volatile oil are much more soluble in solution of sugar than in water; and the same principle applies more or less to all analogous cases. In some instances, as in percolating, it is more convenient to use a weak syrup and to add the remainder of the sugar afterwards.—Pharm. Journ., Mar. 21, 1908, 380.

*Soda Water Syrup—Convenient Device for Making Large Quantities.*—W. C. M. Scott uses the simple device shown by Fig. 66 for making simple syrup for the fountain. It consists of a small barrel with the head removed and replaced by a galvanized iron tank, which is provided with numerous half-inch holes in the bottom. Two layers of cheese cloth being placed over the holes in the tank, the required quantity of sugar is introduced, and water being poured on, the syrup filters through in the usual way and may be withdrawn as required by means of the spigot inserted near the bottom of the barrel.—Bull. Pharm., Aug., 1907, 337.



Simple Soda Water Device.

*Chocolate Syrup—Formulas.*—M. R. Shotwell recommends the following formula which, he claims, produces the finest chocolate syrup for fountain use: Mix 8 ounces of ground chocolate thoroughly

with 8 pounds of sugar, add sufficient sweet milk to make the final product measure 1 gallon, let the mixture come to a boil and pour in 8 ounces of glycerin. When cool, add 4 drachms of extract of vanilla.

Another formula, by which the tendency of the powdered cacao to lump is overcome, is recommended by "Getman's Drug Store." Pour 8 ounces of powdered cacao and 2 pounds of granulated sugar into a kettle, stir thoroughly, add 8 ounces of water, stir to a paste, add 8 ounces more of water, heat, boil two minutes, and strain. Then mix with 3 quarts of simple syrup and one ounce of (extract of?) vanilla.—Bull. Pharm., Dec., 1907, 513.

*Syrupus Ferri, Quininae et Strychninae Phosphatum, U. S. P. VIII.*—Alfred I. Cohn finds it difficult to see why a special preparation—Glycerite of the Phosphates of Iron, Quinine and Strychnine—should have been introduced into the U. S. P. for the sole purpose of making the above named syrup, and recommends the following formula, which he considers will meet the official requirements:

Soluble ferric phosphate .....	20.0 Gm.
Quinine.....	26.0 Gm.
Strychnine .....	0.20 Gm.
Distilled water.....	30.00 Cc.
Alcohol.....	60.00 Cc.
Dil. sulphuric acid.....	8.00 Cc.
Syrup to make .....	1000.00 Cc.

Dissolve the ferric phosphate in the distilled water by the aid of heat, and add 400 Cc. of syrup. On the other hand, dissolve the quinine and strychnine in the alcohol by the aid of heat and the diluted sulphuric acid, and add 400 Cc. of syrup. Now pour the alkaloidal solution into the solution of the iron phosphate, and add sufficient syrup to make the whole measure 1000 Cc. In this case, as in the case of elixir of the phosphates of iron, quinine and strychnine (which see) care must be taken not to pour the solution of the iron phosphate into the alkaloidal solution, otherwise a precipitate forms which is rather unmanageable.—Amer. Drugg., July 8, 1907, 5.

Commenting on the above, Otto Raubenheimer observes that, as in the case of Dr. Cohn's proposed formula for the elixir of phosphate of iron, quinine and strychnine, the proposed formula for the syrup does not contain the phosphates of the alkaloids. But, apart from this, the introduction into the U. S. P. and the use of the glycerite for the preparation is justified on practical grounds. For it is a notorious fact that Easton's syrup—a synonym which may be applied to the U. S. P. syrup—will darken if kept on hand, because the free acid present caramelizes the sugar. The glycerite is permanent, and serves admirably for the extemporaneous preparation of the syrup, as designed by the U. S. P. VIII.—Ibid., April 12, 1907, 70.



*Syrup of Hydriodic Acid—Pharmacopæial Assay.*—P. S. Lane assayed eight samples of syrup of hydriodic acid by the U. S. P. method, showing percentages of HI ranging from 0.44 to 1.18 per cent.—average 0.91 per cent. Three of the samples gave decided tests and the other five slight reactions for  $\text{H}_3\text{PO}_3$ . Difficulty was experienced in determining the end reaction on account of the reducing action of  $\text{H}_3\text{PO}_3$  upon  $\text{AgNO}_3$ , causing a blackening of the solution. The reduced silver may be removed by filtration, but in any case high results are obtained owing to reduction of a portion of the  $\text{AgNO}_3$ .—Amer. Journ. Pharm., Aug., 1907, 366.

*Syrup of Raspberries—Ellagic Acid the Cause of Spontaneous Turbidity.*—The slight turbidity which frequently manifests itself in carefully prepared and originally perfectly bright syrup of raspberries on standing has been the subject of investigation by Dr. Kunz-Krause and Dr. Schweisinger, who have determined that this is not attributable to yeast or pectin, but to the presence of ellagic acid, which separates in the form of small rhombic prisms, and has been fully identified by its properties and by its elementary analysis, which leads to the formula  $\text{C}_{11}\text{H}_8\text{O}_8$ , established by Wöhler and Merklein. As a practical result of their investigation the authors conclude that it is a mistake to endeavor the clarification of the syrup, rendered turbid by ellagic acid, by either boiling or filtration, and that a permanently clear syrup of raspberries can only be obtained by allowing the ellagic acid to subside and then decanting it.—Pharm. Ztg., lii (1907), No. 75, 786.

*Raspberry Syrup.—Detection of Cherry Juice.*—The method of Elsner for the detection of cherry juice in raspberry syrup is based upon the dissimilar reaction of coloring matters of the two fruit juices with basic lead acetate—raspberry juice giving a dense blue-green precipitate and colorless filtrate whilst cherry juice gives a blue-red, although faintly colored filtrate. Jonscher finds, however, that this test is not available for raspberry juice as syrup freshly prepared from unfermented fruits, such also yielding a blue-red filtrate. On the other hand, genuine raspberry juice which has been kept some time and treated with preservatives, such as alcohol, formic acid, salicylic acid, etc., will yield colorless filtrates under the conditions of the test.—Pharm. Ztg., liii (1908), No. 19, 192; from Ztschr. f. öffentl. Chem., 1908, No. 2.

*Syrupus Scillae Compositus, U. S. P. VII.—A Faulty Formula.*—Alfred I. Cohn notes that in the compound syrup of squill of the U. S. P. VIII, no account has apparently been taken of the fact that the fluidextract of squill is acid (made with acetic acid), while the fluidextract of senega is made with potassium hydroxide, and that the ultimate result is the neutralization of the alkali and the probable separation of polygalic acid. It might perhaps be well to assure the preparation being faintly alkaline rather than acid. Such a condition would not effect the squill prepara-

tion, while it would tend to prevent any possible precipitation of the polygalic acid of the senega fluidextract.—*Amer. Drugg.*, July 8, 1907, 6.

*Syrupus Thymi Compositus*—*Formula*.—The following formula for a compound syrup of thyme, one of the preparations of thyme which in recent years are exploited as specialties for the relief of spasmodic coughs, asthmatic affections, etc., is given in "*Svensk Farm. Tidskrift*:" Compound fluidextract of thyme (see under "Fluidextracts"), 60.0; alcohol, 30.0; distilled water, 30.0; potassium bromide, 2.5; syrup, 450.0.—*D-Amer. Apoth. Ztg.*, March, 1908, 11.

*Syrup of Tolu, B. P.*—*Improved Manipulation*.—Alexander McCutcheon, referring to the persistency with which the tenacious balsam residue adheres to the bottom of the pan in which tolu balsam is boiled with water, as directed in the B. P., states that by placing the balsam on a sheet of parchment paper covering the bottom and sides of the vessel, pouring on the water and boiling, the trouble is entirely obviated. The sticky residue may then be removed with the paper to which it adheres completely. *Pharm. Journ.*, Feb. 22, 1908, 221.

*Syrupus Visci Albi*—*Formula*.—Delassus suggests a syrup of mistletoe, prepared as follows: Dissolve 1 Gm. of aqueous extract of mistletoe (which see under "Extracta") in 10 Gm. of boiling water, and add the solution to 990 Gm. of simple syrup.—*Pharm. Ztg.*, lii (1907), No. 71, 739; from *L'Union Pharm.*, 1907, No. 8.

*Syrup of Wild Cherry—How Should It Be Prepared?*—J. C. Buckner calls attention to the scanty literature on the subject of wild cherry bark and the syrup, and that hardly any two investigators had agreed on the active constituents of the bark. Several years ago Prof. Cline called attention to the fact that the syrup of wild cherry of the U. S. P. was not a very desirable preparation, his objection being that in the official process an undue amount of tannin was extracted. As an improvement, the drug was macerated with water of the formula, warmed to 60° C., for two to four hours, percolated and the glycerin added. In this the sugar was dissolved in the proportion of 75 Gm. of sugar to 100 Cc. of syrup. In the experiment made by Mr. Buckner, he obtained by this method a pretty, clear brown, and less astringent syrup, containing 0.028 per cent. HCN, or 0.002 per cent. less than in a syrup prepared according to the U. S. P. VIII directions. Among the other experiments, also, the tannin was removed by means of rasped hide (5 per cent.) from the percolate, in one case, and by recently precipitated and thoroughly washed ferric hydrate (20 Gm.). The syrup detannated by the hide process, while of a straw-color, has a much finer flavor than the syrup made by Prof. Cline's process, which in turn is preferable to the U. S. P. product on account of its comparatively less astringency. The objection to the detannated syrup, on account of absence of color, may be overcome by adding caramel and

tincture of cudbear to give the requisite shade. The author quotes Wood, Cushny, Wilcox, and Sollman, as agreeing that syrup of wild cherry possesses practically no therapeutic properties, as being merely a pleasant vehicle, and that the minute amount of HCN having little if any medicinal effect.—Proc. Texas Pharm. Assoc., 1907, 77-80.

#### TABLETTÆ.

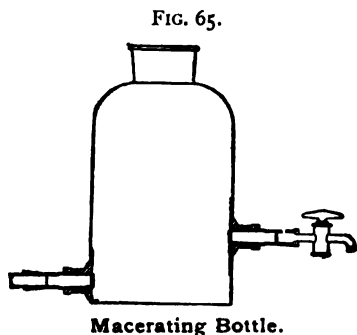
*Tablet Chemicals* are the subject of a critical discussion in a paper of C. S. N. Hallberg, in the "Proceedings" of this Association, 1907, 177-178.

*Tablet Making—Evolution and General Instruction.*—W. J. Uglow Woolcock has written a very instructive paper on the "Art of Tablet-Making," with particular reference to the compressed form. Preliminarily he directs attention to the fact that preparation of compressed tablets (pills) of medicaments, although of comparatively recent growth, is by no means new, since more than sixty years ago attention was called in "The Pharmaceutical Journal" (May 1, 1844) to "a specimen of bicarbonate of potash compressed into the form of a pill by a process invented by Mr. Brokedon, and for which he has taken out a patent." The patent appears to have been issued on December 8, 1843, under No. 9,977, describing the details of "Shaping Pills, Lozenges, and Black Lead by Pressure Dies." It relates to manufacturing pills and medicated lozenges, by causing the proper materials, when in a state of granulation, dust, or powder, to be made into form and solidified by pressure. Mr. Woolcock observes that modernly the manufacture of compressed tablets has attained large proportions; the advantages and disadvantages of this form of medication have been discussed at considerable length, and the discussion has led to improvements in processes which undoubtedly left something to be desired. The ideal tablet would combine accuracy of dose with perfect disintegration and a polished exterior—conditions which can be attained only with attention to minute details. These are discussed by the author under five headings, viz.: (1) The construction of a formula. (2) The reduction of the substance or substances to powder and incorporation with a granulating agent. (3) Granulation. (4) Lubrication. (5) Compression. Referring to the original for the details of these several operations, it may be mentioned in conclusion that in compressing the granules care should be taken to regulate the pressure to suit the requirements of each tablet. Lozenges and tablets which have to be sucked slowly require to be compressed very hard. In the case of lozenges a larger percentage of gum is used than in any tablet which is required to break up in the stomach, and naturally no disintegrator is used. Tablets which are intended to be crushed to powder before administration—such as mercury with chalk—are compressed as lightly as possible. Other tablets should

be made just hard enough to bear rough handling without breaking.—*Pharm. Journ.*, Feb. 29, 1908, 249-252.

#### TINCTURÆ.

*Tinctures.*—The identification of tinctures by chemical means is the subject of a paper by Frederic E. Niece in the "Proceedings" of this Association, 1907, 479-485.



Macerating Bottle.

*Tinctures, etc.—Convenient Macerating Bottle.*—Hugo Kraft has devised the macerating bottle shown by Fig. 65, which is intended particularly for conveniently preparing tinctures, etc., by the maceration process directed in the G. P. After macerating the drug for the required period, the greater part of the tincture may be drawn off clear by

the upper stop-cock shown in the drawing, after which the marc is drained as much as possible through the tube near the bottom, which is protected on the interior by a sieve, and is ordinarily closed with a cork. The drained marc, which is readily removed through the wide mouth of the bottle, is then expressed and, after filtration with the drained liquid, added to the clear decantate.—*Pharm. Ztg.*, liii (1908), No. 30, 301.

*Leaf-Tinctures—Method of Identification and Distinction from Root-Tinctures.*—A. Richaud and Bidot recommend the following convenient method for distinguishing tinctures prepared from leaves and herbs from tinctures of roots and other drugs containing no chlorophyll: 5-6 drops of the tincture are diluted with water until a nearly colorless mixture is obtained, and a few drops of ammonia (or another alkali) are carefully added. In the case of a leaf-tincture a yellow-green zone will appear at the point of contact, and on shaking will develop throughout the liquid; whereas with preparations of drugs which contain no chlorophyll this reaction is not obtained, the only exception being senega root (*radix polygalæ*), the preparations of which are also colored green-yellow by alkalies. Extracts and other galenicals may be examined in the same way after suitable dilution.—*Pharm. Ztg.*, liii (1908), No. 28, 278; from *Journ. de Pharm. et Chim.*, xxvii (1908), No. 6.

*Tincture of Benzoin—Method of Admixture with Glycerin and Rose Water.*—Valentine Schmidt recommends the following simple method to secure a perfectly white emulsion, free from separation of conglomerated resin, and perfectly stable, by mixing tincture of benzoin, glycerin and rose water in the following manner: Mix 1 oz. of glycerin and sufficient rose water to make 4 oz. of final mixture and shake well in a bottle. Then

pour  $1\frac{1}{2}$  drachms of tincture of benzoin very slowly and carefully on the top of the mixture, cork the bottle and, holding it by the neck, invert it once or twice slowly without shaking. The result is a perfect emulsion. Other resinous tinctures may be emulsified in the same way with like satisfactory results.—Pacific Pharmacist, Nov. 1907, 346.

*Tinctura Ferri Pomata—Direct Method of Preparation.*—Hohn and v. d. Wielen recommend the following direct method of preparing tincture of ferrated extract of apples: 1000 p. of pulp, obtained in the usual way from sour apples, and 40 p. of powdered iron are carefully mixed, and set aside for two days at the ordinary temperature, then 14 days more at  $40^{\circ}$  C., with frequent stirring. The mixture is strongly expressed, the expressed liquid is heated on a steam-bath for at least an hour, so as to prevent further fermentation, and the iron-content determined in it. According to the quantity of iron found in this liquid, it is then diluted or evaporated so that on the addition of the necessary quantity of water and of spirit of cinnamon it shall contain from 0.5 to 0.7 per cent. of iron and 6 per cent. of spirit of cinnamon.—Pharm. Ztg., lii (1907), No. 64, 670; from Pharm. Weekbl., 1907, No. 30.

*Tincture of Iodine* is the subject of a critical discussion by C. H. La Wall, in the "Proceedings" of this Association, 1907, 156-159.

*Tincture of Iodine—Convenient Bottle for its Preparation.*—C. J. Lötschert has secured a German patent on the bottle, the details of which

FIG. 68.



Convenient Bottle.

are plainly shown by Fig. 68, intended for the convenient preparation of tincture of iodine: The stopper consists of two parts, the outer, hollow, open at the top and provided with a perforated, sieve-like bottom, which

is accurately ground to fit into the wide neck of the bottle, and is long enough to extend some distance into the bottle, so that when the latter is filled with liquid it will dip below its surface. This hollow part, in turn, is provided with an ordinary ground-glass stopper. Its use is obvious. If tincture of iodine is to be prepared, the bottle is nearly filled with alcohol, the necessary quantity of iodine is placed into the hollow stopper, and, after closing this with the ground-glass stopper, is simply allowed to stand until, in a short time, the iodine is dissolved by circulatory displacement. Obviously, also, the bottle may be used for producing saline solutions, etc.—Pharm. Ztg., liii (1908), No. 40, 399.

*Tinctura Iodi, U. S. P. VIII—Commercial Quality.*—A. E. Pflaum assayed a number of samples of tincture of iodine from different pharmacists. All those containing potassium iodide, as required by the U. S. P. VIII, were of the required strengths. Two samples containing no KI were also deficient in iodine—Amer. Journ. Pharm., Aug. 1907, 367.

*Tinctura Lithantracis, Unna—Formula.*—Digest 300 p. of oil of coal tar (Oleum lithantracis) with 100 p. of ether, and 200 p. of alcohol (95 per cent.) with frequent shaking, for two weeks. Decant the tincture from the undissolved portion, and filter it after standing some time.—Pharm. Ztg., lii (1907), No. 53, 556.

*Tincture of Strophanthus—Method of Identification.*—Dulière recommends the following simple method for the identification of tincture of strophanthus: The addition of equal volumes of water or of ether causes turbidity—the one due to the separation of fat, the other to the difficult solubility of strophanthus in ether. The presence of the latter is determined by adding a drop of ferric chloride solution to several Cc. of the tincture, evaporating to dryness, and moistening the residue with 5 drops conc. sulphuric acid. A brown-red solution results, changing after the gradual addition of a few drops of water to violet-brown, and yielding a green precipitate on the addition of more water.—Pharm. Ztg., liii (1908), No. 28, 278; from Journ. de Pharm. d'Anc., 1908, No. 4.

*Tinctura Thymi Composita—Formula.*—The following formula for a compound tincture of thyme is given in "Svenst. Farm. Tidskrift": Herb. thymi, 30.0 Gm.; herb. serpylli, 30.0 Gm.; fol. castaneæ, 60.0 Gm.; flor. rhœados, 40.0 Gm.; rad. senegæ, 40.0 Gm.; spiritus, 700.0 Gm.; aq. dest., 300.0 Gm., make a tincture.—D. Amer. Apoth. Ztg., March, 1908, 11.

*Warburg's Tincture—Formula Proposed for the Belgian Formulary.*—The "Journ. de Pharm." mentions the following formula for Warburg's Tincture, which is proposed as a substitute for the original formula in the new Belgian "Formulaire": Tinct. rhei (1:5), 40.0; tinct. croci (1:10), 80.; tinct. angelicæ, 40.0; tinct. foeniculi, 20.0; tinct. gentianæ, 10.0; tinct. myrrhæ, 10.0; spirit. camphorati, 20.0; quin. sulph., 20.0: alcohol (94 per cent.), 560; dist. water, 200.0.

*Warburg's Tincture with Alas* is to contain, in addition to the above-mentioned substances, 2 per cent. of aloes.—Pharm. Ztg., lii, (1908), No. 13, 132.

UNGUENTA.

*Ointment Bases—Superiority of Benzoin to Benzoic Acid Preservative.*—In an interesting and comprehensive review of "Dr. Unna's Magistral Formulas" (which see), Dr. Paul Runge calls attention to the fact that Dr. Unna invariably directs that the fats used for the preparation of his ointments and pastes shall be benzoinated—not with benzoic acid, however, as is the usual direction in the G. P. IV, but with benzoin, and emphasizes that the superiority of benzoin as a preservative of fats and oils is fully confirmed by his own experience.—Pharm. Ztg., lii, (1907), No. 53, 555.

*Fatty Ointment Bases.—Method of Benzoinating.*—A correspondent (W) of the *Apotheker Zeitung*, referring to Dr. Runge's strictures concerning the relative value of benzoin and benzoic acid for the preservation of fats (see preceding abstract) states that his experience coincides with that of Runge. He has, for example, for the last 20 years benzoinated mutton suet by melting 1 Kgm. with 10 Gm. of benzoin (which he finds sufficient), and the container (a wooden box) today smells as sweet as when it was first put to use for this purpose. As a practical expedient, he recommends that the benzoin be pulverized with an equal quantity of anhydrous sodium sulphate, which prevents the resin from baking together during the heating with the fat, while the residue is easily removed from the vessel—hot water dissolving the salt and loosening up the resin.—Apoth. Ztg., xxii (1907), No. 55, 580.

*Ointment Bases—New Formulas.*—Robert Tocher recommends the following formula for ointment bases to replace the more or less unsatisfactory unguentum paraffini (B. P.) which, as made at the average dispensing counter, is frequently a short, curdy-looking mass :

*Unguentum Lanæ Anhydrosium*, is made with equal parts of anhydrous woolfat and yellow soft paraffin. It melts at 40°–42° C., and has the specific gravity 0.897.

*Unguentum Lanæ Hydrosum*, is made with equal parts of hydrous woolfat and white soft paraffin. It melts at 38°–40° C., and has the specific gravity 0.896.

These bases not only mix well with all insoluble powders, soluble powders, and oils, but mix admirably with watery solutions, and better with spirituous solutions than any other bases do. Compared with the fine ointments producible with these bases, those prepared with unguentum paraffini album (m. p. 46°–47° C., sp. gr. 0.830), present a coarse appearance under the microscope. For the purpose of preparing ointments in

which the incorporation of large quantities of thin oils and other liquids is desirable, such for example as 50 per cent. of methyl salicylate, regarded as a desideratum by some pharmacologists, the author suggests hard ointments, prepared according to the following formulæ :

*Unguentum Durum Flavum* : Equal parts of yellow wax and woolfat.

*Unguentum Durum Album* : Equal parts of white wax and hydrous woolfat.

While the several bases mentioned are not intended to supersede the known bases, they may serve for individual practice. They have been adopted by the committee for the Glasgow Formulary, which is nearing completion.—Pharm. Journ., Jan. 25, 1908, 85-86.

*Ointments—Convenient Method of Determining the Constituent Fat.*—

W. v. Rijn recommends the following simple method of determining the fat in ointments, which lends itself with particular advantage to the examination of ointments and pastes containing boric acid, mercury, zinc oxide, starch, etc. : One Gm. of the ointment is weighed on paper and shaken, with the paper, with 50 Cc. of petroleum ether. After subsidence the solution is filtered, and 10 Cc. of the filtrate are evaporated, the residue is dried at 100° to 105° C., and weighed.—Pharm. Ztg., liii (1908), No. 10, 90 ; from Pharm. Weekbl., 1907, No. 51.

*Ointments—Absorption Experiments.*—Dr. R. L. Sutton has made some experiments with the object of testing the rapidity with which substances are absorbed by the skin, employing, in order to get direct results, various tissue stains, in the form of aniline dyes. These were thoroughly mixed with various vehicles and applied to the bare skin of guinea pigs and white rabbits. After the lapse of fifteen minutes to several hours, the patch was excised under anæsthesia. The piece of tissue was blocked, frozen, and cut in such a way as to prevent the stain being carried farther into the tissues. The sections were placed at once in a filtered mixture of honey, 10.0, glycerin, 20.0, and water, 70.0, and later mounted, and examined in the same medium. For oily and ethereal vehicles scarlet was found most suitable, while for spirituous ones fuchsin was used. The results show that lard, simple or benzoated, and pure goose grease are the most quickly absorbed of all the substances tested. Petrolatum is a poor penetrant unless applied with friction. Wool-fat, alone, is absorbed very slowly, but when mixed with a more fluid material, such as olive oil, it readily enters the skin. The addition of a small amount of cedar-wood oil (10 per cent.) to an ointment considerably increases the rapidity of absorption.—Pharm. Journ., June 6, 1908, 760 ; from Brit. Med. Journ., May 23, 1908, 1225.

*Ointments.—Formulas of Dr. Unna.*—The following formulas for various ointments prescribed by Dr. Unna in his practice are communicated by Dr. Paul Rupp, who calls particular attention to the fact that all the



benzoinated fatty bases directed in them must be prepared with benzoin (see "Ointment Bases" \*), *not* with benzoic acid. While the ingredients in some of the formulas are proprietary preparations, on the whole it is believed that the formula will prove useful and can be followed in most cases without difficulty.

*Unguent. Bismut. Oxy-chlorat., Unna:* Bismuth oxychloride, 10 p.; benzoinated lard, 90 p.

*Unguent. Cantharidin., Unna:* Ol. cantharidini (see "Olea"), 10 p.; woolfat ointment (ung. adip. lanae), 90 p.

*Unguent. Casein. Cadinat., Unna:* Oil of cade, 10 p.; green soap, 2.5 p.; distilled water, 17.5 p.; casein ointment, 70 p.

*Unguent. Casein. c. Liantralo., Unna:* Liantral (a proprietary extract of coal tar, prepared with benzin? Rep.), 10 p.; distilled water, 10 p.; green soap, 2.5 p.; casein ointment, 77.5 p.

*Unguent. Chrysarob. Comp., Unna:* Chrysarobin, 5 p.; ichthyol, 5 p.; salicylic acid, 2p.; yellow vaseline, 88 p.

*Unguent. Domesticum., Unna:* Egg-yolk, 40 p.; expr. oil of almond, 60 p. Thoroughly triturate the egg-yolk and gradually add the oil.

*Unguent. Domestic. Cadinat., Unna:* Oil of cade, 10 p.; domestic ointment, 90 p.

*Unguent. Ichthargan., Unna:* Ichthargan (proprietary=silver-ichthyo-late), 1 p., dissolved in distilled water, 2 p., is mixed with woolfat ointment (ung. adip. lanae), 48.5 p., and yellow vaseline, 48.5 p.

*Unguent. Plumbi Refrigerans., Unna:* Mix 20 p., each, of anhydrous woolfat, white lead ointment (ung. cerussæ) and benzoinated zinc ointment, without heat, and add 40 p. of solution of lead subacetate. To be prepared extemporaneously as required.

*Unguent. Pomadinum., Unna:* Oil of theobroma (benzoinated), 30 Gm.; expr. oil of almond (benzoinated), 70 Gm.; oil of rose, 2 drops; triple extract of violets, 1.5 Gm.; triple extract of reseda, 1.5 Gm.; triple extract of jasmin, 1.5 Gm. If these "triple extracts" are not available, increase the quantity of oil of rose to 4 drops.

*Unguent. Pomadinum Comp., Unna:* Resorcin, 2 p.; precipitated sulphur, 4 p.; ungt. pomadinum, 94 p.

*Unguent. Pomadinum Sulfur., Unna:* Precipitated sulphur, 4 p.; ungt. pomadin.; 96 p.

*Unguent. Pyraxolin. Comp., Unna:* Pyraxolin-Mielck (= oxidized pyrogallol), 5 p.; ichthyol, 5 p.; salicylic acid, 2 p.; yellow vaseline, 88 p.

---

\* Note: Dr. Runge calls particular attention to Dr. Unna's requirement that *all* fatty bases directed in his formulas shall be benzoinated. It will be noticed that while in many of the formulas for ointments this is specified, in others this specification is omitted.—REP.

*Unguent. Pyrogallol. Comp., Unna:* Pyrogallol, 5 p.; Ichthyol, 5 p.; salicylic acid, 2 p.; yellow vaseline, 88 p.

*Unguent. Refrigerans, Unna:* Vaseline, 10 p.; woolfat, rose water, orange flower water, of each, 30 p.

*Unguent. Resorcini Comp., Unna:* Resorcin, 5 p.; ichthyol, 5 p.; salicylic acid, 2 p.; yellow vaseline, 88 p.

*Unguent. Viride c. Lupum, Unna:* Salicylic acid, 10 p.; solution of antimony chloride (liq. stibii chlorat. P. G. Suppl.), 10 p.; creosote, 20 p.; extract of cannab. ind., 20 p.; anhydrous wool fat, 40 p.—Pharm. Ztg., lii (1907), No. 53, 556.

*Adeps Benzoinatus, U. S. P., VIII.—Manipulation.*—Alfred I. Cohn suggests that in the directions for making benzoinated lard it would have been advisable to order mixing the coarsely powdered benzoin with an equal weight of clean gravel and inclosing the mixture in a muslin or cheesecloth bag, and suspending the latter in the lard by a suitable contrivance. The author uses a string tied to the bag and held by a loop passed through a hole in the cover of the granite iron vessel used, and secured by a short stick. This arrangement obviates the need of a stirrer, as the bag can readily be swung around in the melted fat; furthermore, if the fabric used for the bag is properly chosen, there is no need of straining the finished product.—Amer. Drugg., July 8, 1907, 5.

*Adrenine Ointments—Formulas.*—A. Gunn and E. F. Harrison propose the following formulas for producing 1:1000 adrenine ointments, which yield stable and elegant preparations:

Adrenine .....	0.10
Boric acid .....	0.20
Water.....	3.00
Hydrous wool fat.....	50.00
Soft paraffin, sufficient to produce.....	100.00

Dissolve the boric acid in the water, then add the adrenine and dissolve; mix the solution with the wool fat by trituration, and finally add the soft paraffin. A

*White Adrenine Ointment* may be obtained by the following formula, manipulating as directed for the preparation of adrenine inhalant (see under "Olea"):

Adrenine .....	0.10
Castor oil.....	5.00
Hydrochloric acid, a sufficient quantity.	
Absolute alcohol .....	2.00
Soft paraffin, white, sufficient to produce.....	100.00

A method for the examination of these ointments is given (see *Adrenine* under "Organic Chemistry").—Pharm. Journ., Aug. 31, 1907, 810.

*Mercurial Ointment—Quick Extinction of Metallic Globules.*—G. E. Brasington recommends as an expedient for the convenient and quick extinction of mercury globules, to vigorously agitate the required quantity of metal with an *equal volume* of compound tincture of benzoin in a bottle. The minutely divided mercury, which results almost immediately, may then be incorporated with the fat (preferably lanolin slightly warmed) with a minimum of labor.—Bull. Pharm. Era, Dec., 1907, 512.

*Ointment of Mercury—Improved Assay.*—G. Heyl recommends a method for determining the mercury in the ointment which combines that of the G. P. with the stannous chloride method of Dieterich. The ointment is shaken out with ether according to the G. P. directions and proportions, if necessary by the aid of gentle heat, and the residual mercury-magma is then gently heated with 1-2 Cc. of solution of stannous chloride, which effects a rapid and complete coalescence of the finely divided mercury globules. After washing with water to remove the tin salt, then with alcohol, and finally with a little ether, the metal is dried at 30°-40° C., and weighed.—Apoth. Ztg., xxiii (1908), No. 13. 126-127.

*Ointment of Nitrate of Mercury, B. P.—Chemistry.*—R. C. Cowley asks: "What is nitrate of mercury ointment?" In the course of a recent examination of the B. P. ointment, the tests for the nitric radical gave negative results. On removing the fat with petroleum ether the residue had the appearance of an oleate of mercury, but as it was not entirely soluble in ether or alcohol, he concluded that it consisted of the mercury salts of oleic, stearic, and elaidic acids. He had heretofore held the view, which he believes is commonly held, that when the cold solution of mercurous nitrate was poured into the hot fat the chemical action consisted in the oxidation of the mercurous into mercuric nitrate, and a simultaneous polymerization of the olein into elaidin. This view is undoubtedly incorrect. The B. P. ointment is acid, but the acidity is due to the free acids in the fat, and not to nitric acid. In view of these statements he considers it would be interesting to know in what respect the B. P. nitrate of mercury ointment can claim any advantage over the ointment of the oleate, which it practically is.—Chem. and Drugg. May 23, 1908, 806.

*Ointment of Yellow Mercuric Oxide.*—Formula proposed for the new Germ. Pharmacopœia, see *Hydr. oxydat. via humida paratum*, under "Inorganic Chemistry."

*Ung. Hydrarg. Oxydati Flav.—Proposed Formula for the Ital. Pharm.*—At the Congress of Pharmaceutical Chemists in Milan, the following formula was proposed for inclusion in the New Italian Pharmacopœia: Yellow mercuric oxide, 5.0 Gm.; woolfat, 5.0 Gm.; vaseline, 90.0 Gm. The mercuric oxide is freshly precipitated, washed with water, then with alcohol and alcohol-ether, and finally with ether. While moist it is tritur-

ated with the woolfat, then heated on the water-bath until the ether is evaporated, and lastly mixed with the vaseline.—Pharm. Ztg., lii (1907), No. 102, 1059; from Rép. de Pharm., 1907, No. 11.

*Compound Resorcinol Ointment, N. F.—Manipulation.*—E. Fullerton Cook, after a number of experiments, recommends the following modification of the N. F. directions for preparing compound resorcinol ointment which quickly yield a satisfactory ointment without changing the ingredients: Dissolve the resorcinol (6 parts) in  $10\frac{1}{2}$  parts of water, with the aid of a little heat. Warm  $24\frac{1}{2}$  parts of anhydrous woolfat contained in a porcelain dish on a water-bath, using just sufficient heat to soften the woolfat, and add the solution of resorcinol, stirring continuously; then add the 6 parts of bismuth subnitrate and 6 parts of zinc oxide, continuing trituration until perfectly smooth. Having melted the paraffin and petrolatum together, add the mixture to that previously effected (while still warm), stirring continuously. Finally, incorporate the 12 parts of oil of cade, and continue the stirring until the ointment is firm. A superior ointment can thus be made in 15 minutes, whereas the N. F. method may require two hours.—Amer. Journ. Pharm., Mar., 1908, 119-122.

*Sulphur Ointment—Changes on Keeping.*—In a former paper Dr. Conrad Stich advocated and prescribed a method of preparing sulphur ointments from fatty or oily solutions of sulphur (see Proceedings, 1905, 604). He now reports on and discusses the keeping qualities of these ointments, from which it appears that by prolonged keeping the sulphur separates for the larger part again from its solution. Furthermore, that in such and other sulphur ointments the individual crystals of sulphur gradually increase in size, the larger ones at the expense of the smaller ones which enter into the solution to effect this transposition. The details of this interesting paper, which is illustrated by numerous cuts, showing the different crystalline forms observed under the microscopic lens, must be consulted in the original.—Pharm. Ztg., lii (1907), No. 75, 789-790.

*Sulphur Ointments—Rational Method of Preparation.*—E. Riecke, having investigated the therapeutic value of different sulphur ointments prepared by methods of Stich (see preceding abstract) suggests the following method as producing the most stable and efficient ointments: Sulphur is precipitated from a thoroughly chilled solution of calcium polysulphide and triturated after washing, while still moist, with the ointment base (anhydrous woolfat, according to Stich). Obtained in this way, the ointment, which the author proposes to designate as

*Pasta Sulfuris Puliformis*, has proven therapeutically very efficient and to possess marked stability.—Pharm. Ztg., lii (1907), No. 12, 1059.

*Sulphur Ointments—Use of Glycerin to Facilitate Preparation.*—Daisy A. Frick makes the following suggestion which facilitates the incorporation of the sulphur in ointments: First, triturate the sulphur in a dry mortar,

then carefully triturate with just sufficient glycerin to form a smooth paste, which is easily accomplished. The base is then added in small quantities at a time, and a fine, smooth ointment results.—Bull. Pharm., Aug., 1907, 338.

*Unguentum Veratrinæ, U. S. P. VIII—Method of Incorporating the Alkaloid.*—Alfred I. Cohn observes that it is a settled axiom in making ointments that, wherever possible, solid substances to be incorporated in the ointment should be in the very finest possible powder, if insoluble, or, if soluble, brought into solution before mixing with the ointment. This, of course, assuming that bringing the substance into solution does not in any way impair the medicinal action of the remedial agent or adversely affect the ointment. The method long used by the author for making veratrine ointment, is to dissolve the veratrine in a very small quantity of alcohol, add a little castor oil, and stir until the alcohol has evaporated, after which the benzoinated lard is added. The U. S. P., however, prescribes the use of expressed oil of almond; therefore, to adopt the procedure to the U. S. P. formula, it is only necessary to dissolve the veratrine in a little ether or chloroform, in both of which it is quite soluble, add the expressed oil of almond, triturate until the solvent has evaporated, and then incorporate the benzoinated lard.—Amer. Drugg., July 8, 1907, 6.

#### VINA.

*Wine of Pepsin—Clarification with Talc.*—W. Wiesenthal, having occasion to clarify some pepsin wine which had unaccountably become turbid resorted to talc and subsequently filtration for its clarification. He found, however, that simple agitation of the talc with the wine, followed by filtration, did not accomplish the desired clarification; but if the wine was added gradually to the talc under trituration and then filtered, a permanently clear filtrate was obtained.—Pharm. Ztg., liii (1908), No. 10, 100.

#### MISCELLANEOUS.

*Artificial Carlsbad Salt—Necessity for Pharmacopœial Tests.*—A controversy concerning the responsibility in a case of poisoning by barium nitrate which had been supplied by the wholesaler as "Artificial Carlsbad Salt," has been the incentive to an examination of seven different specimens of this preparation by G. Frerichs, who found that none of them had been prepared with ingredients of the purity demanded by the G. P. In view of the finding, and the fact that the G. P. gives no tests of identity and quality the author recommends that when Carlsbad salt is purchased in the market the pharmacist should assure himself of the identity as well as quality of its components by simple tests, which he briefly describes.—Apoth. Ztg., xxiii (1908), No. 14, 135-136.

*Chromic Catgut—Lord Lister's Method of Preparation.*—Of various

methods tried for the preparation of catgut for surgical purposes, Lord Lister finds the most satisfactory to be that in which chromium sulphate is used. This salt has one fault, however, in that it is quite untrustworthy as a germicide, but the defect can easily be remedied by the use of a little mercuric chloride. Further, as commercial specimens of chromium sulphate are subject to considerable variation, it is best to prepare it as required, as described below. The chromic, or sulpho-chromic catgut, is thus prepared: The preparing liquid must be twenty times the weight of the catgut, so that for 40 grains of the catgut 800 grains of the preparing liquid is required. The sublimate liquid is prepared by dissolving mercuric chloride, 2 grains, in distilled water, 320 grains. The chromic sulphate liquid is prepared by dissolving chromic acid, 4 grains, in distilled water, 240 grains; to this is added sufficient sulphurous acid (B. P.) to give a green color, not a distinct blue color. If, however, a blue color should be obtained, a few drops of chromic acid solution should be added to restore the green tint, after which the liquid is made up to 480 grains with distilled water. The sublimate solution is added to this chromium sulphate solution, and the catgut is immersed in the mixture for twenty-four hours, after which it is dried on the stretch. Thus prepared, catgut remains actively antiseptic in its substance for an indefinite period. But, while the substance of the catgut is thus not only aseptic but powerfully antiseptic, its dry surface is liable to contamination by contact with septic material, and it is essential that, before use, it should be washed with some trustworthy germicidal liquid. It is, therefore, advisable to immerse it in a 1 in 20 solution of phenol for about fifteen minutes before actual use.—Pharm. Journ., Jan. 25, 1908, 89; from Brit. Med. Journ., Jan. 18, 1908, 125.

*Flavoring Extracts—Pharmacopœial Standards Desirable.*—I. V. S. Stanislaus, in a voluminous paper, discusses the question of standards for flavoring extracts, and points out very forcibly that this class of preparations comes within the province of the qualified pharmacist, and that they should be required to respond to tests laid down in our national standard, which is the United States Pharmacopœia.—Amer. Jour. Pharm., May, 1908, 225-232.

*Perfumery—Manufacture by the Pharmacist.*—I. V. S. Stanislaus contributes an interesting paper on the manufacture of perfumery by the pharmacist, in which he reviews the various industrial methods of obtaining floral odors, synthetic perfumes, etc., and gives the results of his practical observations, together with formulas for various popular odors. The paper can be profitably consulted only in the original, in Proc. Pa. Pharm. Assoc., 1907, 252-259.

*Riga Balsam—What Is It?*—O. Haastrup observes that the so-called "riga balsam" is usually described as being essentially compound tincture

of benzoin, or very similar. He finds, however, that the riga balsam, which comes from Russia in stone jugs, and which is in common use by the sailors of the German and Baltic Oceans, is a very different substance. It is more oily, resembles "boonekamp of maagbitter," and is possibly a similar mixture, containing also extract of licorice and comp. tincture of benzoin.—Pharm. Ztg., liii (1908), No. 32, 320.

## C. NEW REMEDIES

### AND TRADE-NAMED SPECIALTIES.

*Acain-Oil* (Solutio oleosa Acaini basici) is the name given to an oily solution of "diparaanisylmonophenetylguanidin" the hydrochlorate of which was introduced some years ago as a local anesthetic under the name of "acain" (see Proceedings, 1899, 480). This solution is prepared with arachis oil and contains 10 per cent. of the base, which, as obtained by precipitation from the hydrochloride, has a resinous consistency, rendering it unsuitable as a commercial product. The arachis oil used for the solution must be purified carefully, and in particular must be free from all traces of free oleic acid. The acain-oil is regarded as affording the best analgetic in painful affections of the eye, as well as for the alleviation of pain occasioned by the application of medicaments to that organ, such as dionin, silver nitrate, copper sulphate, etc.—Pharm. Ztg., liii, (1908), No. 11, 111.

*Ade-Biscuits* are aperient biscuits, which are stated to contain 0.1 Gm. of "paraphthalein" (probably meaning "phenolphthalein" ?) in each dose.—Pharm. Ztg., lii, (1907), No. 95, 994.

*Aepfelkakao* (apple-cacao) and *Aepfeltee* (apple-tea) are agreeably tasting substitutes for coffee and tea. The "apple-cacao" has the advantage over pure cacao, that it has a stimulating and faintly acidulous taste, and that in consequence of its content of apple-powder it is free from constipating effects. The "apple-tea," which is produced from apples alone, has proven useful as a daily beverage in nervous conditions, and also in cases of cardiac and stomach affections.—Pharm. Ztg., lii (1907), No. 84, 880.

*Aether Orthoformicus* is "methenyltriethylether" ( $\text{CH}.\text{OC}_2\text{H}_5.\text{OC}_2\text{H}_5.\text{OC}_2\text{H}_5$ ), a colorless liquid, b. p.  $145^\circ\text{C}.$ – $146^\circ\text{C}.$ , which must not be confounded with the long-known "formic acid ethyl ester" ( $\text{HCOOC}_2\text{O}_5$ ), which boils at  $54^\circ\text{C}.$  It is recommended as a valuable antispasmodic, particularly in whooping-cough and other coughs, in doses up to 25 drops.—Pharm. Ztg., liii (1908), No. 35, 351; from E. Merck's Annual Rep., 1907.

*Aethon* is the name by which ethyl-formic ether is exploited as a remedial agent, particularly to assist in the so-called euquinine treatment of

whooping-cough. It is given in doses of 25 drops in water at each attack. Pharm. Ztg., liii (1908), No. 25, 252.

*Aethrin* is the name given to an ointment which has heretofore been exploited under the name of "Rhizan" as a remedy in nasal catarrh. It contains 5 per cent. of menthol-aethrol, a water-soluble mentholdesicin soap.—Pharm. Ztg., lii (1907), No. 93, 972.

*Alcuenta* are water-soluble alcohol ointments exploited by the Chem. Fabrik Helfenberg.

*Alexipon* is the name given to "acetylsalicylic acid ethyl ester," and is said to be useful as an antirheumatic remedy.—Pharm. Ztg., lii (1907), No. 101, 1050.

*Allergin* is the name given to a preparation of "alttuberculin" of standardized activity, which is recommended, like the previously exploited so-called "tuberculosediagnosticum" and "tuberculin-test," for the ophthalmo-reaction modernly employed in the treatment of tuberculosis. It is supplied, sterilized and perfectly stable, in different concentration, enclosed in sealed tubes containing the quantity necessary for the reaction.—Pharm. Ztg., liii (1908), No. 11, 111.

*Alophen* is the name given to chocolate-coated pills, each containing: Aloin, 0.015 Gm.; phenolphthalein, 0.003 Gm.; extr. of belladonna, 0.005 Gm.; ipecac, 0.004 Gm.; and strychnine, 0.0008 Gm.—Pharm. Ztg., lii (1907), No. 95, 994.

*Andolin* is the name given to a "cocaine free" (!) anesthetic injection, which is stated to be a mixture of 2 per cent.  $\beta$ -eucaine and 1 per cent. stovaine (in sodium chloride) solution in the proportion of 3:1, which is heated to near the boiling-point, and then mixed with two drops (?) of a 1 per cent. adrenalin solution. (Presumably these indefinite proportions refer to the dose, which is supplied in sealed tubes ? Rep.).—Pharm. Ztg., liii (1908), No. 31, 312.

*Andolin* is composed according to H. Mayer of: Eucaine, 0.5; stovaine, 0.75; suprarenin hydrochlor., 0.008; physiol. salt solution, sufficient to make 100.0.—Pharm. Ztg., liii (1908), No. 19, 192; from D. Med. Wschr., 1908, No. 9.

*Antiperiostin*, which has been claimed to be a solution of a definite compound of cantharidin and mercuric iodide (see Proceedings, 1907, 717), has been analyzed by W. Lenz and R. Lucius, who find it to be a solution of 20 per cent. mercuric bichloride and 5 per cent. potassium iodide in 75 per cent. tincture of cantharides.—Apoth. Ztg., xxii (1907), No. 81, 875.

*Antiperiostin*, it now appears, is prepared according to a patented process, which is claimed by the patentee to yield a 30 per cent. solution of a well-defined compound of mercury, iodine and cantharidin. This com-



pound is obtainable in the form of a dense, yellowish-white precipitate, which may be dissolved in alcohol, or incorporated in the dried or in the moist condition with other medicinal vehicles.—Pharm. Ztg., liii (1908), No. 9, 88.

*Antirheumol*, a rheumatism embrocation which was stated to contain 20 per cent. of salicylic acid glycerin ester in neutral solution with glycerin and diluted alcohol (see Proceedings, 1907, 717), is now said to be prepared in a concentrated form *for export*, which consists of a 50 per cent. solution of the ester in glycerin.—Apoth. Ztg., xxiii (1908), No. 3, 27.

*Antitulase* is the name given to a serum, which is claimed to possess powerful immunizing energy against tuberculosis, and is obtained from horses, cattle and sheep which have been treated with different tuberculase preparations. Its practical importance in medicine has not yet been demonstrated.—Pharm. Ztg., lii (1907), No. 80, 841.

*Antyase*, *Farase* and *Tebean* are immunizing agents obtained by the action of chemically indifferent substances, such as sugars, glycerin, salt, etc., upon *bacteria* under certain prescribed conditions, and consist essentially of bacteria, made innocuous by the process, and of their extracts. These products are supplied in form of sterilized powder, free from any preservative addition, and quite stable, even at elevated temperatures.

*Antyase* is recommended as an immunizing agent against typhus. It is recommended to inject at first 2 Mgm. subcutaneously, then, 6 to 10 days later, 4 Mgm.; a third injection of 6 Mgm. being administered after the same interval if the two previous injections have been well tolerated.—Pharm. Ztg., lii (1907), No. 80, 841.

*Aphrodine* is the trade name under which "yohimbine," prepared by Spiegel's method, is exploited in England.—Chem. & Drugg., Jan. 4, 1908, 20.

*Argoferment* is the name given to a silver preparation, which is said to consist of colloidal silver obtained by an electrolytic method. It is supplied in the form of pure solution containing 0.02 per cent. of silver.—Pharm. Ztg., liii (1908), No. 3, 26.

*Arsenogen* is the name of a specialty prepared according to the specifications of a German patent for paranuclein. It contains about 16.4 per cent. of iron, 2 per cent. of phosphorus, and 14 per cent. of arsenic in chemical, although loose, combination with paranucleic acid. Its therapeutic use is dependent on the pharmacologic activity of its components.—Pharm. Ztg., liii (1908), No. 11, 111.

*Arsentriferrol* is the name given to a faintly alkaline aromatic solution of triferrin (iron paranucleinate) and "arsenogen" (which see). It is

recommended as a well-tolerated general tonic.—Pharm. Ztg., liii (1908), No. 11, 112; from Berl. Klin. Wschr., 1908, No. 4.

*Arsiodin* is the name under which pills, each containing 0.12 Gm. sodium iodide and 0.001 Gm. arsenic, are exploited by an Austrian pharmacist.—Pharm. Ztg., liii (1908), No. 37, 372.

*Arterenol Hydrochloride* is a specialty obtained by the reduction of aminoacetopyrocatechin and conversion of the reduction product into hydrochloride. It is regarded to be "aminoaethenolpyrocatechin hydrochloride," and has the composition  $C_6H_3(OH)_2CHOH.CH_2NH_2.HCl$ . Arterenol hydrochloride forms a finely granular, white, odorless, crystalline powder, very readily soluble in water and in alcohol, and melting at  $141^\circ$  C. Its aqueous solution produces faint anesthesia on the tongue, and gives a green color with ferric chloride. The free base, precipitated by ammonia from the hydrochloride, melts, after drying, at  $191^\circ$  C., and is soluble in excess of alkali. Administered intravenously, the hydrochloride increases blood pressure, similar to the suprarenal preparations, for which it is recommended as a substitute, but the maximum dose is twice as high as that of suprarenin.—Apoth.-Ztg., xxiii (1908), No. 44, 391; from Vierteljahrschr. f. prakt. Pharm., 1908, 1.

*Arthrisin* is the name by which acetylsalicylamide is exploited as a medicament. It has been used by Treufel in acute and subacute articular rheumatism with good results, and is well tolerated, but in his opinion gives no evidence of superiority over the remedies hitherto employed.—Pharm. Ztg., liii (1908), No. 25, 252.

*Aseptol*, which is understood to be a  $33\frac{1}{3}$  per cent. aqueous solution of phenol orthosulphonic acid, has been found by J. Obermiller, on applying the method of separating ortho- and parasulphonic acids recommended by him in his recent study on the action of sulphuric acid on phenol (see Phenol under "Organic Chemistry"), to consist almost entirely of the para-acid (as zinc sulphocarbolate), together with only about 6 per cent. of the ortho-acid. The current view, largely quoted in the literature, that aseptol is a solution of the ortho-acid, is therefore incorrect.—Pharm. Journ., Dec. 21, 1907, 817; from Ber. d. d. Chem. Ges., 40 (1907), 3622-3647.

*Asperrin* is the name given to a specialty which is claimed to contain 24 per cent. of arsenic and 12 per cent. of iron in organic combination. It is a green-yellow powder, but is supplied (only? Rep.) in the form of chocolate tablets, each containing 1 per cent. of asperrin = 0.0024 Gm. As.—Pharm. Centralh., xlviii (1907), No. 39, 809.

*Asklerosol* is the name given to a mixture of the saline constituents of the Kissingen Rakoczy spring with some blood-salts, which is supplied in form of tablets each representing 90 Gm. of Rakoczy water, and is recommended in arteriosclerosis.—Pharm. Ztg., liii (1908), No. 23, 231; from Therap. Rdsch., 1908, No. 5.

*Atoxy*, which is described as the anilide of met-arsenic acid (see Proceedings, 1902, 790), is said to effloresce readily and should therefore be preserved in well-closed containers. Its solutions, also, not infrequently undergo decomposition. Labat proposes a micro-chemical test for its recognition, which is based upon its reactions with nickel and cobalt salts and also with silver nitrate. If a drop of one per cent. solution of cobalt nitrate, or nickel chloride, is placed on an object glass with a drop of 10 per cent. solution of atoxyl, the development of tetrahedric lamellæ, resembling ammonium-magnesium phosphate is plainly visible even under a low-power lens. The author also describes a volumetric method for its quantitative determination, which is based on its precipitation, mol. for mol., with silver nitrate.—Pharm. Ztg., liii, (1908), No. 20, 200; from Rep. de Pharm., 1908, No. 2.

*Atoxy—Composition.*—Atoxy was introduced about five years ago (see Proceedings, 1902, 790), and was said to be a meta-arsenic anilide, having the formula  $C_6H_5NHAsO_3$ , and containing 37.69 per cent. of As. It was highly praised by the manufacturers on the ground that it provided a means of administering apparently unlimited amounts of arsenic without producing toxic effects. The analysis now made by W. A. Puckner and A. H. Clark, in the Chemical Laboratory of the American Medical Association, shows that atoxyl contains only 25.77 per cent. of arsenium. From the analysis and the report of other investigators it was concluded that atoxyl is the sodium salt of arsenic acid in which one hydroxyl radical of arsenic acid has been replaced by the aniline radical. Agreeing with this, the manufacturers have now adopted the formula  $C_6H_4(NH_2)(AsO_3OH.ONa)_2$ , as indicating the composition of the substance. The analysis referred to showed the presence of three molecules of water, but other experimenters have found varying quantities of water. The advertising literature states that "forty times as much arsenic can be assimilated in this form as when the element is exhibited in Fowler's Solution or other of the ordinary arsenical preparations." But calculation shows that in reality the recommended dose of arsenic in the form of atoxyl is but one and a half times as great as the advised dose of arsenic as Fowler's Solution.—Pharm. Journ., Nov. 16, 1907, 641.

*Atoxy and Arrhenal—Delicate Test for their Recognition and Distinction.*—According to J. Bougault a delicate reagent for the distinction of *atoxy* (sodium anilarsinate) and *arrhenal* (sodium methylarsinate) is prepared by dissolving 20 Gm. of sodium hypophosphite in 20 Cc. of water, adding 200 Cc. of hydrochloric acid, specific gravity 1.17, and pouring off the clear solution from the precipitated sodium chloride. A little atoxyl mixed with some of this reagent and a few drops of  $\frac{N}{10}$  iodine solution produces an orange-yellow precipitate, or if the amount of atoxyl does not exceed  $\frac{1}{2}$  Mgm., a milky turbidity will be produced in a quarter

of an hour. If warmed on a water-bath the precipitate rapidly darkens, liberating arsenic. The composition of the precipitate is represented by the formula  $C_6H_5NAs$ . Arrhenal, on the other hand, gives under the same conditions a black precipitate of methyl arsenic. 0.25 Mgm. of atoxyl may be detected in urine as follows: 5 Cc. of urine is warmed over a water-bath for thirty to forty-five minutes with 10 Cc. of the reagent, and 1 drop of  $\frac{N}{10}$  iodine solution; at the end of this time the urine will be a dark brown color. A more delicate test consists in evaporating 250 Cc. of urine in a vacuum to a syrupy consistence, taking up the residue with 10 Cc. of dilute hydrochloric acid (3 : 1), adding 30 to 40 Cc. of reagent, and 1 or 2 drops of iodine solution. After six hours the mixture is diluted with 10 Cc. of water and filtered; the precipitate is washed with dilute hydrochloric acid (3 : 1), and is then placed, together with the filter paper, in an excess of iodine solution, and after saturating with potassium bicarbonate, the whole is allowed to stand for a quarter of an hour; it is then filtered, and the filtrate, after evaporating to about 2 or 3 Cc., is mixed with 10 Cc. of reagent. The characteristic yellow precipitate is then rapidly formed.—Pharm. Journ., Nov. 2, 1907, 575; from Jour. de Pharm. et Chim. (6), 26 (1907), 13.

*Barta* is the name given to a specialty exploited as an aphrodisiac in form of pastilles, each containing 0.13 Gm. of extract of damiana (from the leaves of *Turnera diffusa*), 0.01 Gm. of zinc phosphide and 0.0082 Gm. of nux vomica.—Pharm. Ztg., liii (1908), No. 23, 231; from Therap. Rdsch., 1908, No. 9.

*Bechicin* is a specialty prepared from the whooping-cough secretion, which is recommended internally in doses of 10-12 drops in the treatment of tussis convulsiva.—Pharm. Ztg., liii (1908), No. 23, 231.

*Benzoylsuperoxyd*, which was mentioned in the report of 1906 (see Proceedings 1906, 687) as a disinfectant and antiseptic specialty, has been examined by L. Golodetz in Unna's laboratory, who recommends the following reactions for its identification: If a few granules (several milligrams) are added to 10-12 drops of conc. sulphuric acid, the benzoylsuperoxide is decomposed with decrepitation and evolution of white vapors, having the odor of benzophenone or fluorenon. If then a drop of diluted aqueous solution of formaldehyde is added to the mixture a blood-red color is immediately developed, which remains a long time, and disappears only on addition of much water.—Pharm. Ztg., liii (1908), No. 23, 231; from Chem. Ztg., 1908, No. 20.

*Betuneparol* is the name given to an infusum betulæ, possessing stability, which is exploited as a diuretic and as a solvent for kidney stones.—Pharm. Ztg., liii, (1908), No. 23, 231.

*Biocitin* is the name given to a specialty said to consist essentially of pure lecithin and the nutrient substances of the egg and of milk. It is

supplied in form of an odorless powder, soluble in water and aqueous fluids, and is recommended as a general tonic in various ailments.—Pharm. Ztg., liii (1908), No. 7, 70.

*Biocitin* is stated by the manufacturer to be composed of about 10 per cent. of lecithin, 12 per cent. nucleovittellin, etc., 35 per cent. caseinogen, 28 per cent. lactose, 6 per cent. fat, 7 per cent. water, and 2 per cent. of nutrient salts from egg-yolk and milk.—Ibid., No. 19, 192.

*Bisol* is the name applied to a special kind of liquid adhesive plaster, but has recently also been applied to a specialty introduced by an Austrian firm, which is said to be "bismutum phosphoricum solubile."—Pharm. Ztg., lii (1907), No. 76, 801.

*Bissulin* is the name given to an ointment used in form of vaginal suppositories, containing 0.25 per cent. sozoiodol mercury, which are used in veterinary practice. The same compound is also supplied in form of urethral bougies, for the treatment of male animals.—Pharm. Ztg., liii (1908), No. 23, 231, and No. 33, 332; from Berl. Tierärztl. Wschr., 1908, No. 16.

*Blaud-Atoxyl Capsules*, which contain a mixture of Blaud's pill mass and atoxyl, are recommended as being a well-tolerated arsenic preparation.—Pharm. Ztg., lii (1907), No. 99, 1032.

*Blénogonin* (capsules, ovules, bougies), is the specific name given to preparations exploited for the treatment of affections of the urinary glands. The capsules contain oil of santal, extract of matico, and hexamethylenamine; the ovules and bougies contain anæsthesin and albargin.—Pharm. Ztg., liii (1908), No. 23, 231.

*Blén-Lenicet Ointment*, recommended for the treatment of blennorrhœa of the eyes, is a combination of 5 or 10 per cent. of "Lenicet" (see Proceedings, 1906, 698), with a resistant ceresin-vaseline, designated as "Euvaseline."—Pharm. Ztg., lii (1907), No. 89, 935.

*Bonain's Mixture* is composed of equal parts of crystallized menthol, cocaine hydrochloride and pure phenol. It is stated in "Münch. Med. Wschr." that the addition of 5 Mgm. of adrenaline to 5 Gm. of this mixture will produce a preparation which effects instantaneous anesthesia on application.—Pharm. Ztg., lii (1907), No. 102, 1059.

*Borovertin*, which was mentioned among "New Remedies" in last year's report (see Proceedings 1907, 720), is now described as hexamethylenetetramine combined with three molecules of meta-boric acid ( $= (\text{CH}_2)_6\text{N}_4 \cdot 3\text{HBO}_2$ ). It is obtained by the interaction of the base with 3 mol. of boric acid ( $\text{H}_3\text{BO}_3$ ) at the ordinary temperature, during which the ordinary boric acid is converted into meta-boric acid ( $\text{HBO}_2$ ) by splitting off 3 mol. of water. Borovertin is a white powder, having a faint acid reaction and a bitterish-saline taste, which is, however, not pronounced. It is soluble at 20° C. in 11 p. of water and in 48 p. of alcohol, but insoluble

in ether, and is carbonized when heated without melting, giving off alkaline vapors and leaving an acid ash. On boiling with water, borovertin is gradually decomposed; its solutions must therefore be prepared without heat. It is supplied in form of powder and in 0.5 Gm. tablets; the dose is 1 Gm. (or 2 tablets) at meal time, but not exceeding 4 times daily, as a urinary antiseptic in cystitis, etc.—Pharm. Ztg., lii (1907), No. 71, 740.

*Boryl* (*Ethyl Borosalicylate*) is obtained according to Monteil by heating together boric acid, 62, salicylic acid, 138; water, about 200; then adding to the solution, alcohol (95 per cent.), 60; sulphuric acid, about 40; and boiling (under a reflux condenser). When esterification is complete, and after washing with water to remove the sulphuric acid, boryl is obtained in crystalline needles, with a higher melting-point than that of salicylic acid. It is intended for use externally and internally as an antiseptic, and for the treatment of rheumatism.—Pharm. Journ., April, 1908, 518; from L'Union Pharm., 49, (1908), 55.

*Bromglidine*, a preparation similar to "iodglidine" (which see) is recommended as an innocuous sedative remedy. It is supplied in form of tablets, each containing 0.05 Gm. of bromine.—Pharm. Ztg., liii (1908) No. 3, 26.

*Bromotussin* is the name given to a preparation, which, similar to the so-called "bromum solidificatum," facilitates the application of bromine inhalations in any locality without the necessity of liquid bromine.—Pharm. Ztg., lii (1908), No. 16, 161; from Med. Klin., 1908, No. 7.

*Bronchiline* is the name given to a plaster spread on flannel, having a caoutchouc base combined with small quantities of the fluid extracts of belladonna, chamomile, grindelia and thyme, oil of curled mint (*Mentha crispa*), oil of rosemary, and camphor. The plaster is recommended for whooping cough.—Pharm. Ztg., liii (1908), No. 31, 312.

*Camphosal* is the name under which the neutral camphoric acid ester of santalol is exploited. It is a brownish-yellow oil, of sp. gr. 0.987, and readily soluble in ether, alcohol, benzol, chloroform, petroleum-ether, and ligroin, but sparingly soluble only in 70-per cent. alcohol, which distinguishes it from santalol and sandal oil. The odor is faint aromatic, the taste feebly bitter. By alcoholic potash it is only slowly saponified. It is claimed to be an absolutely reliable remedy in all affections of the prostate, and is supplied in form of capsules, each containing 0.25 Gm. of camphosal, two or three capsules being given 3 or 4 times daily.—Pharm. Ztg., liii (1908), No. 8, 79.

*Caprina* is the name given to a protective for sheep against sheep-pox, which, similarly to the vaccine-lymph employed as a protective against small-pox, is obtained from goats after they have been artificially infected with sheep-pox virus.—Pharm. Ztg., lii (1907), No. 93, 972; from C.-Bl. f. Bakter., 40 (1907), No. 11/12.

*Capsulæ Geloduratae* are gelatin capsules, hardened by means of formaldehyde, which pass intact through the stomach into the intestines, where they dissolve easily.—Pharm. Ztg., lii (1907), No. 81, 852; from Münch. Med. Wschr., 1907, No. 34.

*Carboneol* is the name given to a product obtained by extracting coal tar with carbon tetrachloride and evaporating the solution. It forms a deep-black, thin liquid of sp. gr. 1.328, of not disagreeable odor, and is recommended in substance or in form of alcoholic solution, pastes, salves, etc., as an efficient and non-irritant remedy in eczema.

*Carboterpin* is the name given to a solution of coal tar in so-called terpinol (a product obtained by the distillation of terpin hydrate with diluted sulphuric acid). It is a deep brown-red fluid, of sp. gr., 0.91, not disagreeable in odor, which yields on evaporation about 20 per cent. of a tarry residue. It has been used with good results in the treatment of psoriasis.—Pharm. Ztg., liii (1908), No. 88; from Berl. Klin. Wschr., 1908, No. 3.

*Caricin* is the name of a syrup prepared from (the juice of) figs, with additions as follows: syrup of figs, 75 per cent.; extract (=fluidextract? Rep.) of senna, 20 per cent.; elixir of orange, 5 per cent. The product is recommended as a mild but promptly active aperient, having an agreeable taste.—Pharm. Ztg., lii (1907), No. 87, 914.

*Caropan* is the name given to a mixture of equal parts of extract of malt and "samogen" (which see). It is recommended as being an agreeably-tasting, readily soluble tonic and nutrient remedy for children.—Pharm. Ztg., lii (1907), No. 89, 935.

*Ceridin* appears to be the name given in England to a German specialty obtained from yeast, which was introduced some years ago under the name of *Cerolin* (see Proceedings, 1904, 610). The new name has been given so as not to conflict with the British trade-name regulations.—Pharm. Ztg., liii (1908), No. 50, 500.

*Chininum Nucleinicum* is a specialty recommended for the treatment of syphilis. It contains 60 per cent. of quinine and 40 per cent. of nucleinic acid, forming a white, bitter-tasting powder very sparingly soluble in water. It is administered by intra-muscular injection in 0.5 Gm. doses, suspended in olive oil (1:20), every second day, alternating with intravenous injections of 0.8 Gm. of quinine hydrochloride.—Pharm. Ztg., liii (1908), No. 23, 231; from D. Med. Wschr., 1908, No. 10.

*Cholauxanol* is the name given to an emulsion recommended as a specific for cystic calculi, which is said to have the following composition: 15 p. each of the non-alcoholic and freshly prepared fluidextracts of rhubarb, taraxacum, chelidonium and liverwort; 10 p. of carminative tincture; 0.5 p. of validol; 0.25 p. of methyl salicylate; 25 p. each of alcohol and glycerin; 70 p. of oil of almonds; sufficient acacia, tragacanth and distilled

water to make 275 parts of emulsion.—Pharm. Ztg., liii (1908), No. 44, 438.

*Chrysyl* (*Zinc Boropicrate*) is prepared according to Monteil as follows: Picric acid, 349, boric acid, 62, and water, about 400, are heated together, and zinc oxide, 82, is added to the solution. The resulting yellow powder is introduced as a sedative drying agent for use in the treatment of skin affections and for ophthalmic application.—Pharm. Journ., April 18, 1908, 518; from L'Union Pharm., 49 (1908), 55.

*Cineral* is the name given by Leszczynski to an emulsion of hydrargyrum pur., 4.0 Gm.; ol. palmæ steril., 20 Cc.; ol. sesami steril., 20 Cc., which is claimed to be free from mercurial toxicity when employed for intra-muscular injections.—Pharm. Ztg., liii (1908), No. 7, 70; from Ztschr. d. Oesterr. Ap.-V., 1908, No. 2.

*Citrocoll*, the so-called citrate of amidoacetparaphenetidin (see Proceedings, 1907, 721), has been subjected to chemical investigation by Zernik, who finds that the claim advanced by the manufacturers that it is a definite chemical compound is not justified. By the solvent action of boiling alcohol it is separable into two substances. A substance crystallizing from water in white leaflets and melting at  $192^{\circ}\text{C.}$ – $193^{\circ}\text{C.}$ , is found in the solution, while the main portion of the citrocoll remains undissolved. By repeated crystallization of this alcohol-insoluble body from water, prismatic needles are obtained, which melt at  $198^{\circ}\text{C.}$ – $200^{\circ}\text{C.}$ , and were recognized as being simply "phenocoll citrate" ( $2\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_8 + \text{C}_6\text{H}_8\text{O}_7$ ).—Pharm. Ztg., liii (1908), No. 29, 289; from Ber. d. D. Pharm. Ges., 1908, 1.

*Coeliacin* is the trade name given to tablets prepared from the mesenteric gland of the sheep, each representing 0.3 Gm. of the fresh gland. It has been used with success, and is recommended for the treatment of various forms of sclerodermis.—Münch. Med. Wschr., 1907, No. 25.

*Cor* is the name given to hot compresses which, applied after immersion in water, generate carbonic acid, and thus develop the local effect of the latter.—Pharm. Ztg., liii (1908), No. 31, 313.

*Darman* is the specific name given to "purgative tablets," which contain, in addition to cascara sagrada, 0.03 Gm. of phenolphthalein.—Pharm. Ztg., liii (1908), No. 42, 419.

*Decilan* is a disinfectant and antiseptic preparation which is defined by the manufacturer as a "formaldehyde potassium oleinate solution," and claimed to contain 6 per cent. of formaldehyde. It is a clear, alkaline, agreeably odorous fluid, miscible with water, alcohol or glycerin, in all proportions.—Pharm. Ztg., liii (1908), No. 11, 112.

*Diaspirin* is the name given to the succinic acid ester of salicylic acid (see *succinyl-salicylic acid*). Its pronounced diaphoretic action makes it



particularly useful in febrile conditions consequent to colds, etc.—Pharm. Ztg., liii (1908), No. 37, 372.

*Digalen*, the so-called "soluble digitoxin" of Cloetta (see Proceedings, 1905, 552), has been the subject of pharmacological experiment by Fraenkel, who agrees with Huchard in controverting the claim put forward by Cloetta, that this secret preparation is devoid of accumulative action. On the contrary, digalen is found to behave exactly as crystalline digitalin as regards cumulative results, and to require the same precautions of dosage and careful supervision. The favorable results obtained by Cloetta are attributed to his having employed too small doses, and to having carried on his observations for too short a time. It is evident, therefore, that in this respect digalen possesses no therapeutic advantage over digitalin.—Pharm. Journ., May 23, 1908, 696; from *Nouv. Reméd.*, 23 (1907), 433.

*Dimentholformal* (dimethylmethyle ether) is a patented specialty obtained by heating "dimethyldimethyle ether" (which see) with concentrated hydrochloric acid in a sealed tube, whereby 1 mol. of formaldehyde splits off, leaving the very stable compound "dimethylmethyle ether."—Pharm. Ztg., liii (1908), No. 5, 50.

*Dimethyldimethyle Ether*, a specialty recommended as a disinfectant and febrifuge, is prepared under a German patent by the action of a symmetric dihalogen methyl ether on metallic menthol compounds. For example, a solution of 10 Gm. of symmetric dichlormethylether (or 18 Gm. dibrommethylether), in 100 Cc. of petroleum-ether is added drop by drop with stirring and refrigeration to a solution of 30 Gm. of menthol in 300 Cc. of toluol saturated with sodium. When the mixture has clarified completely the liquid is washed consecutively with soda solution, diluted hydrochloric acid, and, repeatedly with water. After the petroleum-ether and toluol are evaporated by heating, and in a vacuum, the product is fractionated under 15 Mm. pressure, whereby 25.8 Gm. of the substance is obtained between 238°–242° C. The fraction, recrystallized from alcohol, forms fatty-glistening, scaly crystals, melting at 47° C.; insoluble in water, but readily soluble in ether, acetone, hot alcohol, and in fixed and volatile oils.—Pharm. Ztg., liii (1908), No. 5, 50.

*Dioform* is the name given to "acetylene dichloride," which is recommended as an innocuous agent for producing narcosis by inhalation.—Pharm. Ztg., lii (1907), No. 76, 801; from *Münch. Med. Wschr.*, 1907, No. 37.

*Dioform* (*Acetylene dichloride*) is described in E. Merck's Annual Rep. (1907) as a colorless liquid, having an odor resembling ethylene chloride and chloroform. It has the symmetric formula of 1.2 dichlorethylene  $\text{CHCl.CHCl}$ ; the sp. gr. 1.29, and the boiling-point about 55° C. Its use as a substitute for ethyl chloride and ether must for the present be held in abeyance.—Pharm. Ztg., lii (1908), No. 35, 351.

*Diuiodin* is the name given to "iodotheobromine pastilles," which are recommended in arteriosclerosis.—Pharm. Ztg., liii (1908), No. 49, 490.

*Ecalen* is the name given to a corn-remedy, composed of 0.75 Gm. salicylic acid, 2.5 Gm. glacial acetic acid, 2.5 Gm. extract of cannabis ind., and 20.0 Gm. saponaceous paste.—Pharm. Ztg., lii (1907), No. 84, 880.

*Eglatol* is a specialty which is designated by its exploiters as "non-poisonous chloralhydrate," and is claimed to be composed of chloralhydrate, phenyl-dimethylpyrazolon, trimethylxanthin, and carbonic acid menthyl-ester—the proportions not given. It is a dense, clear liquid, completely soluble in alcohol, ether, and chloroform, only partly soluble in water, and is supplied in form of gelatin capsules, each containing 0.5 Gm. of the medicament, which is recommended as a nervine and hypnotic.—Pharm. Ztg., liii (1908), No. 42, 419.

*Eifelango* is a mineral mud found in the vicinity of the Neuenahr Baths, which is recommended for mud-baths, poultices, etc.—Pharm. Centralh., xlix (1908), No. 17, 321.

*Eisensorisin* (iron-sorosin) is "sorosin" (which see) in which one-half the potassium guaiacolsulphonate is replaced by the same quantity of iron guaiacolsulphonate. It is recommended for the treatment of anæmia.—Pharm. Ztg., lii (1907), No. 76, 801; from Berl. Klin. Wschr., 1907, No. 34.

*Eubornyl* is the name given to *a*-bromisovalerianicacid-borneolester, which is recommended as a specific in neuroses and nerve affections of every description.—Pharm. Ztg., liii (1908), No. 16, 161.

*Eucerinum Anhydricum* is the name given by Unna to a mixture composed of 95 p. of paraffin ointment and 5 p. of the oxysterins separated from woolfat. If this is incorporated with an equal quantity of water, a stable, soft, odorless ointment base, which is designated simply as

*Eucerin*, is obtained. This is by itself an admirable cooling ointment, but may be readily combined with other medicaments. For the treatment of eye, nose, ear and vaginal affections, however, the anhydrous preparation is given preference.—Pharm. Ztg., lii (1907), No. 93, 972; from Med. Klin., 1907, Nos. 42 and 43.

*Euferral* is the name of a specialty represented to be a soluble preparation containing the active constituents of Levico water. It is supplied in the form of gelatin capsules, each containing about 0.012 Gm. iron and 0.00009 arsenic trioxide.—Pharm. Ztg., lii (1907), No. 53, 556; from D. Med. Wschr., 1907, No. 26.

*Eunan* is the name given to a solid form of cresol-soap, prepared by combining cresol with sodium stearate, alcohol and free alkali. It is supplied in form of tablets, each weighing 1 Gm. and containing 0.5 Gm. of cresol, and is recommended on account of its convenience in use and

transportation, its ready solubility in warm water, its less pronounced odor than ordinary cresol preparations, and its smaller content of soap.—Pharm. Ztg., lii (1907), No. 59, 617; from Ztschr. f. Med. Beamte, 1907, No. 14.

*Eupneuma* is the name given to an asthma remedy, to be used by insufflation into the nostrils, which is said to contain the active constituents of stramonium, with anæsthesin, subcutin and methyl-atropine bromide.—Pharm. Ztg., lii (1907), No. 67, 700.

*Eustenin* is the name given by its manufacturer to a theobromine-sodium sodium iodide, for which the formula  $C_7H_7N_4O_2NO.NaI$  is claimed. It has been used with advantage in arteriosclerosis, angina pectoris and aorteurysma, in doses of 0.5 to 1.0 Gm., in form of wafers or solutions.—Pharm. Ztg., liii (1908), No. 37, 372.

*Farase*, obtained as mentioned under "Antyase," is an immunizing agent against glanders in horses, which is injected in doses of 100–200 Mgm.

*Feigol* is the name given to an aperient specialty, for which the manufacturers give the following formula: Extractum frangulæ et caricæ, 60 Gm.; sirupus sennæ compositus and sirupus menthæ piperitæ, aa, 19 Gm.; elixir aromaticum, 2 Gm.—Pharm. Centralh., xlviii (1907), No. 39, 809.

*Ferrotanol* is the name given by a German manufacturing firm to "iron glycerophosphate" for the purpose of identifying it as a product of their manufacture.

*Ferrogen* is the name given to a solution of manganese-iron peptonate, exploited as a specialty in Germany.

*Ferroplasma*, for which the problematic formula  $(C_{12}H_{10}O_{11})nFe$  is given, is stated to be organic iron from cultivated plants of *Rumex crispus*, containing 3 per cent. of iron, and is recommended for anæmic conditions resulting from a variety of ailments.—Pharm. Ztg., lii (1907), No. 99, 1032; from Ztschr. d. Allgem. (Esterr. Ap. V., 1907, No. 47.

*Fixin* is the name by which granulated aluminum lactate is exploited in France as an intestinal disinfectant.—Pharm. Ztg., liii (1908), No. 25, 252.

#### *Fluidextract Specialties:*

*Fluidextractum Cynosbati Tamarindinatum* is a fluidextract of hips, combined with tamarinds to produce painless action. It is recommended in calculus affections of all kinds, in doses of 1–2 teaspoonfuls in a cup of hot water, with or without sugar.

*Fluidextractum Glauci* is prepared from the fresh roots, herb and flowers of the horn poppy (*Glaucus luteum*), and is recommended as a remedy in diabetes in daily doses of 2 to 3 teaspoonfuls.

*Fluidextractum Kanakugi* is prepared from the wood and bark of *Lindera Kanakugi*, and is recommended in syphilis in daily doses of two teaspoonfuls.

*Fluidextractum Nardostachys* (iatamanchi or hindi sumbul) is prepared from the entire herb. It is recommended in nerve affections of every description, in doses of 20 to 30 drops.—Pharm. Ztg., liii (1908), No. 31, 312.

*Formidin*, which has been represented (see Proceedings, 1907, 726) as methylene-disalicylic acid iodide ( $C_{12}H_{10}O_2I_4$ ), does not, according to Zernik, correspond in its composition to this formula, containing about 20 per cent. less than the required amount of iodine.—Pharm. Ztg., lii (1907), No. 53, 556.

*Graminose-Breast-Syrup* is a specialty prepared from extract of carrots and sugar.

*Graminose-Breast-Tablets*, from extract of carrots, cacao and sugar.—Pharm. Ztg., liii (1908), No. 16, 161.

*Griserin*, "New."—Under the name of "Griserin" a specialty recommended as an antiseptic remedy for the internal treatment of tuberculosis was introduced in 1904, and, examined by Zernik, was found to be a mixture of the so-called "loretin" (para-iodo-ana-oxyquinoline orthosulphonate) and about 6 per cent. of sodium bicarbonate (see Proceedings 1905, 537). The manufacturers have now announced that they no longer prepare this old form; but K. Kobert, who has examined the "new Griserin," finds that it is simply a mixture of iodoxychinolinsulphonic acid with about 20 per cent. of sodium bicarbonate. Whether the acid is identical with that of loretin or simply an isomer, remains to be determined; the fact remains that the new preparation closely resembles the older one in its general character—solubility, chemical reactions and doses.—Pharm. Ztg., liii, (1908), No. 34, 334; from Therap. Rdsch., 1908, No. 15.

*Guajacolade* is the name given to "hæmacolade" (= hæmoglobin-chocolate) containing 5 per cent. of potassium guaiacolsulphonate, and is recommended as a remedy in tuberculosis.—Pharm. Ztg., lii (1908), No. 3, 26.

*Guajacose* is the name given to a liquid guaiacol-somatose preparation, containing 5 per cent. calcium guaiacolsulphonate.—Pharm. Ztg., lii (1907), No. 99, 1032.

*Guajadol* is the trade-name given to para-iod-guaiacol, which is prepared from benzolazoguaiacol, and is claimed to possess the pharmacological properties of a general tonic.—Pharm. Ztg., lii (1907), No. 99, 1032; from Chem. Ztg., 1907, Rep., No. 90.

*Guajadol* is obtained by first converting benzolazoguaiacol by reduction into aminoguaiacol and diazotizing this. The diazo product is then dissolved in water and mixed with a solution of potassium iodide, acidulated with sulphuric acid. After vigorously shaking this mixture, a concentrated solution of monosodium phosphate, sodium hyposulphite and

copper sulphate is added; whereupon, on distillation with steam, the paraiodguaiaicol formed distills over. This, when purified, is a colorless, pleasantly odorous mass, having an acrid taste. It is permanent in air and light, scarcely soluble in water, but readily soluble in alcohol and other organic solvents. Its concentrated alcoholic solution becomes deep green on addition of a drop of ferric chloride solution. It is not decomposed in the acid juices of the stomach, but readily by the alkaline secretions of the intestine. Dissolved in equal parts of alcohol and glycerin it has been used with good results, administered subcutaneously in doses of 0.05 Gm., in the treatment of tuberculous sarcomas.—Ibid., No. 101, 1050; from *Nouv. Reméd.*, 1907, No. 23.

*Guathymin*, a specialty recommended for affections of the respiratory organs, is described as containing 7 per cent. of potassium-guaiaicol sulphionate, 4 per cent. extract of thyme and 2 per cent. of aromatic substance, in a medium composed of honey and glycerin.—*Pharm. Ztg.*, lii (1907), No. 99, 1032.

*Hamatopan* (see Proceedings 1907, 727) is prepared by defibrinating blood, treating it with ether to remove decomposition products and micro-organisms, and evaporating the blood so purified with 50 per cent. of extract of malt to dryness in a vacuum.—*Pharm. Centralh.*, xlviii (1907), No. 36, 742.

*Hæmostogen*, *Loeffler* is described as containing in 100 parts: 6.6 hæmatin; 1.5 blood albumin (water-soluble, non-coagulable); 5 albumoses; 0.4 peptones; 0.02 iron sulphocyanide; 3 hydrochloric and phosphoric acids; 16 blood and nerve salts (calcium, iron, magnesium, manganese, potassium and sodium, combined with glycerophosphoric and hypophosphorous acids); and 54 carbohydrates (extract of malt, milk-sugar and gustatory substances. Recommended in anæmia, chlorosis, malnutrition, etc. Dose a small to a heaping teaspoonful, according to age or condition.—*Pharm. Centralh.*, xlviii (1907), No. 39, 809.

*Hageen* is the name given to a 33⅓ per cent. superfatted "soap-creme," recommended for mercuric inunctions.—*Pharm. Ztz.*, liii (1908), No. 23, 231; from *Med. Klin.*, 1908, 297.

*Heidyl* is explained by its exploiter to be composed of: *Extractum myrtilli compositum*, 90 p., and *elixir aromaticum*, 10 p.—*Pharm. Centralh.*, xlviii (1907), No. 39, 810.

*Heliofer* is the name given to a palatable iod-iron cod-liver oil emulsion, containing ¼ per cent. of ferrous iodide.—*Pharm. Ztg.*, liii (1908), No. 42, 419.

*Heretin* "New," obtained from the root of *Heretara jav.* by animal passage—from animals rendered immune to the poison, and now supplied in place of the "heretin" previously described (see Proceedings, 1904,

619)—is recommended in migrain and nervous affection, in doses of 5 to 20 drops.—Pharm. Ztg., liii (1908), No. 23, 231.

*Homorenon Hydrochloride* is a mild suprenen substitute obtained by the action of monochloroacetic acid on pyrocatechin, transformation of the chloracetopyrocatechin produced with ammonia and primary amines, and conversion of the "ethylaminoacetopyrocatechin" into the hydrochloride ( $= C_6H_3(OH)_2CO.CH_2NH_2.C_2H_5.HCl$ ). It forms a loose, white, crystalline powder or colorless, delicate crystalline needles (m. p. about  $260^{\circ} C.$ ), and is readily soluble in water, more difficultly in alcohol. Its aqueous solution is bitter, and produces transient anesthesia on the tongue, and gives with ferric chloride an emerald-green color, which changes on the addition of a little ammonia to carmine-red. The free base, which is precipitated by NaOH and redissolved in excess, melts after drying in the exsiccator at  $185^{\circ} C.$  The crystalline sulphate is difficultly soluble in water. The pharmacologic action of homorenon hydrochloride is qualitatively like that of suprenen, but it possesses only *one-fiftieth* the toxicity of the latter, and is recommended for subcutaneous use in form of 5 per cent. aqueous solution.—Apoth. Ztg., xxiii (1908), No. 44, 391; from Vierteljahrschr. f. prakt. Pharm., 1908, 5.

*Husinol*, which was originally introduced under the name of "ennan," is supplied in the form of 1 Gm. tablets, each containing 50 per cent. of cresol, which are readily soluble in water and are recommended as a superior and innocuous disinfectant. It is claimed to be a compound of sodium stearate and cresol with addition of free alcohol.—Pharm. Ztg., liii (1908), No. 8, 79.

*Hydropyrin* is the name given to sodium acetylsalicylate, and is recommended as a substitute for acetylsalicylic acid, with the advantage of solubility in water.—Pharm. Ztg., lii (1907), No. 101, 1051.

*Injektion Hirsch* which has been represented to contain 1 per cent. of mercuric oxycyanide and 0.5 per cent. of acoïn, contains, according to a recent statement of the manufacturer only 0.4 per cent. of acoïn; a larger quantity being liable to deposit from the solution, but is not necessary to produce complete anesthesia.—Pharm. Ztg., lii (1907) No. 53, 556; from Med. Klin., 1907, No. 26.

*Iod-Benzinoform* is the name given to a solution of 0.1 per cent. of iodine in benzinoform ( $=$  carbon tetrachloride), which is recommended for the disinfection of the hands in place of an iodine-benzin solution of the same strength.—Pharm. Ztg., lii (1907), No. 93, 972.

*Iod-formic Acid* is recommended by Stern for the treatment of chronic ulcerative phthisis, good results having been obtained by intramuscular injections, less favorable per os. He uses for his purposes a so-called stock-solution (10 per cent.), composed of 40 per cent. of formic acid, 25 Cc.; iodine, q. s. (? Rep.); glycerin, sufficient to make 100 Cc. The treat-

ment consists in injecting 10 to 30 drops of a 1 per cent. solution, prepared from this stock solution. If it is given per os, 3 to 4 teaspoonfuls daily are given of a solution prepared by mixing 10 Cc. of the stock solution and 90 Cc. of glycerin, with 1400 Cc. of water.—Pharm. Ztg., liii (1908), No. 19, 192; from D. Med. Wschr., 1908, No. 9.

*Iodglidine* is the name given to a new organic iodine preparation, in which the iodine is combined with vegetable albumin in such manner that the genuine characters of the latter have undergone no change. The preparation is free from nuclein, and is non-irritant. It contains 10 per cent. of iodine, which is very slowly eliminated and readily absorbed. It is completely insoluble in water.—Pharm. Ztg., lii (1907), No. 621, 647.

*Iodil* is said to be the hydrochloride of an unnamed base, and to be composed of 20.02 per cent. of carbon, 5.98 per cent. of hydrogen, 15.64 per cent. of nitrogen, and 35.50 per cent. of iodine. It is supplied in form of white, tasteless scales, soluble in 5 p. of water, and recommended as a substitute for potassium iodide in the same doses.—Pharm. Ztg., liii (1908), No. 33, 332; from Nouv. Reméd., 1908, No. 7.

*Iodofan* ( $C_6H_5I(OH)_2.HCOH$ ), which was described in last year's report (see Proceedings 1907, 730), is said to be split up into iodine formol when brought into contact with wound secretions. It is obtained by iodizing benzol, while iodoform is produced by iodizing methane. Iodoform has the power of inhibiting the growth of micro-organisms, but has no real antiseptic value. Iodofan has anti-bacterial properties, acts very quickly as a deodorizer, and possesses an extraordinary antagonism against bacteria, the latter a property regarded as most important in the treatment of wounds.—Pharm. Journ., May 16, 1908, 630; from Lancet.

*Iodomenin* is the name given to an iodobismuthyl albuminate, which is recommended as a non-irritant substitute for potassium iodide in the prolonged iodine therapy. It is supplied in form of 0.5 Gm. tablets, one or two being administered several times daily. Being insoluble in the acid juices of the stomach, and soluble in alkaline fluids, the remedy becomes effective when it reaches the intestinal tract.—Pharm. Ztg., liii (1908), No. 31, 313.

*Iomacolade* is the name given to "haemacolade" (= haemoglobin-chocolate, containing 2.5 per cent. of iodine salts, and is recommended for persistent iodine treatment.—Pharm. Ztg., liii (1908), No. 3, 26.

*Ketyn* is the name given by its exploiters to a sterilized solution, containing a substance which splits off the benzoyl radical in the human organism and which ameliorates, and eventually relieves, the untoward effects of "nastin" (see Proceedings, 1907, 734, and also " $\beta$ -nastin" below)—another product of the same manufacturer—produced in case the remedy (nastin) has been administered, or the dose repeated, without direction of the prescriber.—Pharm. Centralh., xlviii (1907), No. 39, 810.

*Klonein* is the name given to a solution of milk-albumen which is used in veterinary practice.—Pharm. Ztg., liii (1908), No. 3, 26.

*Kortol* is the name given to a compound eucalyptus liniment, which is exploited as a remedy for rheumatism.—Pharm. Ztg., liii (1908), No. 23, 231.

*Kyphi* is the name given to a Swiss specialty recommended as a remedy for impotence. It is said to be prepared from various fruits and fruit juices, but what these are has not yet been revealed.—Pharm. Ztg., lii (1907), No. 93, 972.

*Lacrothym* is the name of a specialty recommended for cough and other affections of the respiratory organs, prepared in form of tablets, containing as essential ingredients extract of thyme, ammonium chloride and extract of licorice, with aromatic additions.—Pharm. Ztg., liii (1908), No. 11, 112.

*Leciferrin* is the name given to a sweetened, liquid lecithin-iron preparation, which contains besides lecithin and iron, 7 per cent. of cognac and aromatic additions.—Pharm. Ztg., liii (1908), No. 11, 112.

*Lenicet*, *Eston* and *Subeston*, three new aluminum acetate preparations (see Proceedings, 1907, 724), have been subjected to comparative examination by O. Schmatolla, who finds that *lenicet*, which is a  $\frac{2}{3}$  acetate and very difficultly soluble in water, is distinguished from the other aluminum acetates by its extremely fine micro-crystalline form. This distinction is very pronouncedly shown in the microscopic fields (250 diameters) illustrating the author's paper, in contrast with dried and powdered aluminum acetate. *Eston* contains, alongside of quite as fine micro-crystalline, insoluble aluminum acetate as *lenicet*, also some larger crystals of soluble acetate and of aluminum sulphate; while *subeston* contains besides soluble acetate considerable quantities of sulphate and oxide.—Pharm. Ztg., liii (1908), No. 20, 200.

*Lenicet paste* is the name given to an ointment composed of 10 per cent. of *lenicet*, rice-starch, and an ointment-base designated as "Euvaseline." It is exploited as a mild astringent remedy in eczema.—Pharm. Ztg., liii (1908), No. 23, 231.

*Litolein* is a petroleum product, obtained by distilling petroleum and vaseline under certain conditions of pressure and temperature, which is exploited as an antiseptic and antiparasitic remedy in skin diseases. It is a saffron-yellow fluid, free from the heavy petroleum oils, non-saponifiable, neutral, odorless and tasteless, and is applied by penciling the affected parts—avoiding the more inflamed portions—after washing with warm water and drying the surface.—Pharm. Centralh., xlviii (1907), No. 36, 742.

*Luesan* is a specialty produced from syphilis secretions, which is supplied in two forms: *A* = for internal use, *B* = for external use (by pencil-



ing) in syphilitic exanthemes and ulcers.—Pharm. Ztg., liii (1908), No. 23, 231.

*Lyringbin* is the fanciful name given to a fluidextract prepared from *Lyrisma pana-cerminata*, which is exploited as a specific in impotentia virilis and as a superior and non-toxic nerve tonic.—Pharm. Ztg., lii (1907), No. 76, 801 : from D. Med. Wschr., 1907, No. 37.

*Maltyl* is the name given to a dry extract of malt, which is supplied in form of powder and in tablets.

*Milch-Maltyl*, supplied by the same manufacturers, is stated to have the following percentage composition : "Moisture, 2.23 ; salts, 2.65 ; fats, 4.89 ; albumen, 9.87 ; various sugars, 63.72 ; dextrins, 16. Other

*Maltyl-Preparations* are the following : Triferrin-maltyl ; maltyl with iron ; with quinine and iron ; with iodide of iron ; with lime, iron and manganese ; with lime and phosphorus ; and with pepsin.—Pharm. Centralh., xlviii (1907), No. 39, 810.

*Mamminum* is the name given to a organotherapeutic specialty, which is said to represent the synergetic group of the mammary glands. It is supplied in the form of a brownish powder, compressed into 0.3 and 0.5 Gm. tablets, and in the form of a sterilized physiological solution, containing 2 per cent., in sealed tubes, for injection. It is used also in form of enema, dissolved in hot water (1 : 100). Pharmacologically it is claimed to be a useful haemostatic in uterine hemorrhages.—Pharm. Ztg., liii (1908), No. 51 ; from D. Ärzte-Ztg., 1908, No. 12.

*Maretine*, by which name metatolylylhydrazide acid carbonate was introduced as an antipyretic several years ago (see Proceedings, 1905, 543), has been confirmed by G. Fiorio and G. Zambelli as possessing valuable properties. It is very stable, being undecomposed in the system, so that its effects are lasting and do not give rise to cyanosis or collapse. It has marked diaphoretic action. In fevers, doses of 3 to 4 grains reduce the temperature in thirty minutes, the minimum being obtained in three hours, afterwards rising again slowly. It does not depress the heart, and is specially valuable in enteric fevers. In these it should be given in small doses—2 to 3 grains every two hours, but not exceeding 9 to 12 grains in 24 hours. The lowering of the temperature by small doses is not abrupt, but slow and gradual, and is prolonged for three to six hours. Maretine is chiefly eliminated unaltered in the urine and perspiration.—Pharm. Journ., May 16, 1908, 630 ; from Nouv. Remédes, 22, (1907), 463.

*Mayoferin* is the name given to the "maya" employed in the preparation of *yoghurt* (which see).—Pharm. Ztg., liii (1908), No. 49, 490.

*Metacresolanytol* is a proprietary specialty recommended for the treatment of erysipelas. It is a deep black, syrupy liquid, having the odor of ichthyol, and readily soluble in water in all proportions. It is free from

caustic effect when applied externally, either pure or diluted, and when applied to mucous surfaces only occasions a rapidly transient burning sensation.—Pharm. Ztg., lii (1907), No. 62, 647; from Berl. Klin., Wschr., 1907, No. 29.

*Methylenecitrylsalicylic Acid*, which is produced under a German patent by the interaction of salicylic acid or salicylates with methylene-citric-acid halogenides, is recommended as a valuable antirheumatic remedy. It is tasteless and, being entirely free from irritant effects, is in this respect superior to acetylsalicylic acid (aspirin). It is noteworthy also, that in the alkaline intestinal juice formaldehyde is split off.—Pharm. Ztg., lii (1907), No. 87, 914.

*Morphosan* is the name given to morphine methylbromide, which has been recommended as a non-toxic substitute for morphine.—Pharm. Ztg., liii (1908), No. 49, 490.

*Mucoferrin* is the name given to a specialty (evidently of Italian origin) which is said to be prepared from the mucin- and mucoid-substances of snails and the hyaloid substance of freshly-slaughtered oxen by precipitation with ferric chloride. The preparation is similar to carniferrin, and recommended for the same purposes. It is supplied in form of a powder, soluble both in acid and alkaline fluids.—Pharm. Ztg., liii (1908), No. 33, 332; from Nouv. Reméd., 1908, No. 7.

*Nastin-B*, is the designation given to a combination of the fatty substance of the *Lepra-bacillus*, which has been introduced into medicine under the name of "nastin" (see Proceedings, 1907, 734), with a complementary body, possessing, in the meaning of Ehrlich, strong chemical activity, both in *vivo* and in *vitro*, upon the so-called acid-resistant bacilli, from which it removes the fat and thus prepares them for further solution (bacteriolysis), in conformity with Ehrlich's views. The "nastin-B" is therapeutically more active than the original "nastin," which it is now proposed to replace as a remedy in leprosy, in doses of 0.0005 Gm. in oily solution, administered subcutaneously.—Pharm. Ztg., lii (1907), No. 87, 914.

*Neocithin* is the name given to a lecithin-iron preparation, which is recommended as a tonic remedy.

*Neocithin-Kola Pastilles* are also supplied by the same manufacturers.—Pharm. Ztg., lii (1907), No. 93, 972.

*Neoform* is the name given to a basic triiodophenolbismuth, obtained by vigorously shaking at the ordinary temperature an alkaline solution of triiodophenol with the equi-molecular quantity of bismuthyl nitrate, previously dissolved in a 45 per cent. mixture of glycerin and water. A precipitate in form of a yellow, amorphous, ponderous powder is then obtained, which is washed with water to remove nitrate, and dried. This product has the composition of a monohydrate of bismuth oxytriiodophenolate ( $C_6H_2I_3O$ ).

$\text{BiO}_2\text{H}_2$ ); but if the precipitate is washed by decantation with water at about  $80^\circ\text{C}$ .– $90^\circ\text{C}$ . the water is split off, and anhydrous

*Oxytriiodphenolate of Bismuth* ( $\text{C}_6\text{H}_2\text{I}_3\text{O.BiO}$ ) is obtained. This is the substance supplied by the name of "neoform." It is a yellow powder, having a faint odor reminding of xeroform; insoluble in the ordinary solvents, and not affected by light or moisture. Neoform is recommended as a dusting powder in ulcerous tissue formations, etc.—Pharm. Ztg., liii (1908), 32, 320; from Ztschr. d. Oesterr. Ap.-V., 1908, No. 15.

*Nizin* is the name by which zinc sulphanylde is exploited as a substitute for zinc sulphate in gonorrhœa. It forms water-soluble, yellowish crystals, which are insoluble in alcohol and ether.—Pharm. Ztg., liii (1908), No. 23, 231.

*Noridal-Suppositories*, exploited as a specific in hæmorrhoids, are stated to contain each: Calcium chloride, 0.05 Gm.; calcium iodide, 0.01 Gm.; paranephryn, 0.0001 Gm., and Balsam of Peru, 0.1 Gm.—Pharm. Ztg., lii (1907), No. 76, 821.

*Osdurgen* is the name given to a water-soluble lecithin preparation, in form of a powder also containing readily soluble calcium- and iron-salts. It is nearly tasteless, and is administered to children in tablespoonful doses with milk in all ailments affecting their development, in anæmia and debility, and in the treatment of rhachitis, scrofula, dentitio difficilis, etc. Pharm. Ztg., lii (1907), No. 76, 801.

*Ostoxin* is the name given to calcium paranucleinate, which is prepared from casein by a process of pepsin and hydrochloric acid digestion; it occurs as a fine tasteless powder, easily soluble in water. It contains 17 per cent. of calcium, 9 per cent. of nitrogen, and 2.5 per cent. of phosphorus. It is specially recommended in rachitic and scrofulous cases, as it helps the development of bones and promotes metabolism, as is proved by the increase of weight after a relatively short time. Children take it readily, dissolved in milk, coffee, or other liquids. It has also been administered with some success in cases of renal hæmorrhage. The dose is from 1 to 2 Gm. three times daily.—Pharm. Journ., June 20, 1908, 806; from Lancet, June 13, 1908, 1727.

*Pædotheon* is the name given to a nutrient preparation containing extract of malt and hæmatogen.—Pharm. Ztg., liii (1908), No. 23, 231.

*Para-Parisol* is the name given to a cheap form of "parisol" intended as a wound antiseptic in veterinary practice.—Pharm. Ztg., liii (1908), No. 47, 470.

*Parathyreodin* is the name given to a preparation of the thyroid gland in form of tablets, each containing 0.1 Gm. of the epithelial substance. It is exploited as a remedy in tetanus.—Pharm. Centralh., xlviii (1907), No. 39, 810.

*Parotoxin* is the name given by Gérard and Lemoine to a so-called liver-antitoxin, which they recommend for the treatment of tuberculosis on the ground that the liver exerts a pronounced bactericidal and anti-toxic effect towards bacteria and toxins in general. The remedy is said to be prepared from bile by the action of various chemicals which are, however, not specified. It has been used both subcutaneously and per os, it is claimed, with good results.—Pharm. Ztg., liii (1908), No. 7, 70; from D. Md. Wschr., 1908, No. 3.

*Paratoxin* is prepared according to E. Gérard by extracting the dried bile of young animals (oxen, pigs) with petroleum-ether (b. p. 45° C.) and distilling off the solvent. A solid extract is thus obtained, containing besides much cholestrin, also lecithin, oily bodies, and traces of a nitrogenous body which is precipitable by ether. Paratoxin is partially soluble in cold alcohol, but very easily in fixed and volatile oils, as well as in paraffin oil.—Pharm. Journ., Mar. 14, 1908, 361; from Bull. Gén. de Therap., Feb. 23, 1908, 253.

*Peran* is the name given to a chilblain-remedy, containing 1.5 per cent. of anæsthesin in admixture with ichthyol, camphor, tannin and lanolin.—Pharm. Ztg., lii (1907), No. 84, 880.

*Perbolin Salve*, recommended for boils, is said to be composed of 4 p. olive oil, 2 p. wax, 0.5 p. rosin, 0.5 p. "*ol. col. am.*" (?), 0.1 p. oil of rosemary, and 0.01 p. oil of bergamot.—Ph. Ztg., lii (1907), No. 89, 935.

*Peristaltin* is the name given to a water-soluble glucoside from cascara bark, which is claimed to be new, and for which the formula  $C_{14}H_{18}O_8$  is given.—Pharm. Centralh., xlviii (1907), No. 39, 810.

*Pessoid* is the name given to suppositories, composed of a difficultly fusible and only partly soluble fatty body and a more readily fusible aseptic covering, which is to be combined with such medicaments as may be required. When inserted, the medicated covering of the suppository melts, while the interior substance forms a pliable mass, which ameliorates irritations of the intestine, and may be retained in the anus for about 12 hours.—Pharm. Ztg., lii, (1907), No. 93, 972.

*Phenacodin* is the name given to migrain tablets composed of 0.05 Gm. phenacetin, 0.06 Gm. caffeine, 0.02 Gm. codeine, and 0.02 Gm. guarana in each dose.—Pharm. Ztg., liii (1908), No. 42, 419.

*Phenyphrin*, recommended as a local anæsthetic in dentistry, is stated to contain 0.02 Gm. alypin and 0.1 Gm. solution of extract of the suprarenal gland (1:1000) in 1 Cc. of physiological salt solution. It is supplied in sealed vials, ready for use.—Pharm. Ztg., lii (1907), No. 101, 1051.

*Phthysoremid* is the name given to a specialty supplied in form of gelatine capsules, containing a mixture of Koch's bacillus emulsion (new

tuberculin) with a neutral oil, and of stronger and weaker potency, which is recommended in phthisis.—Pharm. Ztg., liii (1908), No. 16, 161.

*Pinus Suppositories and Vaginal Globes*, containing extractum pini canadensis as the medicinal ingredient, are a specialty exploited in Germany for the treatment of the various abdominal affections, and particularly for the treatment of female ailments.—Pharm. Ztg., liii (1908), No. 25, 252.

*Pleacovol* is the name given to p-amidobenzoyl-eugenol, which has been found to possess, besides persistent antiseptic activity, immediate and pronounced local anesthetic properties, even when applied in the smaller doses. It is recommended in dental practice, applied as a covering of the dental pulp and as a filling of the root cavities, and as a remedy in pulpitic toothache.—Pharm. Ztg., lii (1907), No. 60, 629; from D. Monatschr. f. Zahnheilkunde.

*Pleacovol* has been examined by Jung both as supplied in form of powder and as solution. The latter is a dilute solution of tricresol and formalin. The powder is a trituration of tricresol-formalin and traces of normal eugenol with pulverulent p-amidobenzoyl-eugenol and calcined zinc oxide, zinc sulphate and gum arabic.—Ibid., liii (1908), No. 23, 231; from D. Zahnärztl. Ztg., No. 175.

*Plethoral* is the name given to a preparation of *Vaccinium myrtillus*, which is recommended as a remedy for the uncomfortable secondary manifestations in diabetes. It is a clear, red-yellow, aromatic, bitterish fluid, free from alcohol, and is given in doses of a wineglassful two or three times daily.—Pharm. Ztg., liii (1908), No. 8, 79.

*Protoferrin* is the name given to iron paranucleinate, which is supplied in form of powder and tablets.—Pharm. Ztg., lii (1907), No. 99, 1032.

*Ptyophagon* is the name given to a sputum disinfectant, supplied in the form of water-soluble tablets, which are essentially composed of sodium cresolate.—Pharm. Ztg., lii (1907), No. 81, 852; from D. Med. Wschr., 1907, No. 34.

*Pyocyanase* is the name given to a mixture of bactericidal bodies and nucleases, obtained by the autolysis of certain bacteria, which, like the proteolytic enzyme of *bacillus pyocyaneus*, is capable of dissolving the protoplasm of various bacteriæ. The bactericidal action of pyocyanase upon a large number of pathogenic bacteria (diphtheria, anthrax, etc.) and the relative non-toxicity of the preparation, has been established by the experiments of Emmerich, who has also demonstrated its immunizing power against certain infections. The remedy is applied by insufflation and spraying, and has been recommended particularly in cases of grippe and spinal meningitis, in doses of 5 drops up to several cubic centimeters.—Pharm. Ztg., lii (1907), No. 81, 852; from Wien. Klin. Wschr., 1907, No. 25.

*Pyrenol*, which is claimed by its manufacturer to be a definite chemical compound, benzoylsodium thymico-oxybenzoicum, obtained by the combination of benzoic acid, salicylic acid and thymol, has been investigated by Zernik, who pronounces it to be simply a mechanical mixture of equal parts of sodium salicylate and sodium benzoate with about 0.2 per cent. of thymol.—Apoth. Ztg., xxii (1907), No. 100, 1091-1092.

*Quietol* is the name given by a French manufacturer to a specialty recommended as a nerve tonic and antineuralgic. It is stated by the manufacturer that it is obtained by the admixture of valeryl bromide and propyl-dimethylamino-oxyisobutyric acid ester, and is designated as "valeryloxybutyreïn bromhydrate." It forms fine crystalline needles (m. p. 119° C.), having a sharp burning taste and unpleasant odor; readily soluble in water in alcohol. Daily dose, 1-2 Gm.; single dose, 0.5 Gm., in wafers.—Pharm. Ztg., liii (1908), No. 51, 508; from Bull. Commerc., 1908, No. 5.

*Radiogenschlamm* is casing-mud containing radium and having powerful radioactivity, which is used for baths, similarly to ordinary mud-baths, and also in form of poultices, in gout, rheumatism, etc.

*Radiogur-Zylinder* are cylinders filled with a radio-active mass, which are used for preparing radio-active baths by simply immersing them in the water.—Pharm. Ztg., liii (1908), No. 32, 320.

*Resorbol* is the name given to a compound of iodine with higher fatty acids which are easily absorbed through the skin. It is a brown liquid of sp. gr. 1.072, containing 10 per cent. of combined iodine, and miscible in all proportions with water and alcohol; does not stain the skin or linen, is readily removed by washing, and may be combined with a large variety of medicaments.—Pharm. Ztg., lii (1907), No. 76, 801.

*Rhachisan* is the name given to cod-liver oil emulsion which is claimed to possess the advantages, agreeable odor and taste, easy digestibility and stability, and is recommended as a substitute for phosphorated cod-liver oil in all cases in which the latter is usually prescribed. According to the statement of the manufacturer the emulsion contains: Cod-liver oil, 30 per cent.; fatty acid prepared by saponifying cod-liver oil, 1 per cent.; iodine, combined with fatty acids, 0.1 per cent.; lecithin, 0.8 per cent.; nucleins, 1.75 per cent.; iron, in organic combination with ovovitellin, 0.3 per cent.; mannite, which serves to combine the iron with the vitellin, 12 per cent.; glycerin, 5 per cent.; alcohol, 5 per cent.; water, q. s. ad 100. The phosphorus content, calculated as P, is 0.05 per cent.—Pharm. Ztg., liii (1908), No. 23, 231; from Therap. d. Gegenw., 1908, No. 3.

*Salol-Chloral*, which is claimed by Monteil to be a definite chemical compound of salol and chloral, is obtained by heating together on a water-bath at 100 C., salol, 214, hydrated chloral, 147.5. The product is an oily liquid, insoluble in water, crystallizing when cooled. It is introduced as

a hypnotic and antiseptic. Salol-chloral combines with many organic compounds, and is a good general solvent for all organic acids, phenols and aromatic amines. Definite chemical formulæ are given for compounds with camphor, salol, benzoic acid, salicylic acid, boric acid, and analgesine.—Pharm. Journ., April, 1908, 518; from L'Union Pharm., 49 (1908), 53.

*Sellagen-Tablets* are keratin-coated aperient tablets, each containing 0.1 Gm. of each of the following extracts: Cascara, rhubarb, frangula, and condurango.—Pharm. Ztg., lii (1907), No. 84, 880.

*Sic-Serum* is a preparation obtained from the parenchyma and outer membrane of the suprarenal gland of oxen, which is recommended as a specific in whooping-cough. It is given to children in drop doses, to adults in doses of 3–5 Gm., in water, several times daily.—Pharm. Ztg., lii (1907), No. 87, 914; from D. Aerzte-Ztg., 1907, No. 20.

*Sodophthalyl* is the name given to disodium-quinone-phenolphthalein, and is recommended both per os and subcutaneously as a non-irritant laxative.—Pharm. Ztg., lii (1908), No. 32, 320; from Bull. commerc., 1908, No. 3.

*Sodium Paraminophenolarsenicum* is the chemical synonym for *atoxyl* (which see)

*Sodium Thymico-Oxybenzoicum*, introduced as a substitute for "pyrenol" (which see) is like the latter also not a definite chemical compound as claimed, but a mere mechanical mixture containing essentially the same ingredients, but in different proportions. It proved to be a mixture of 1 p. sodium benzoate and 2 p. sodium salicylate with about 0.1 per cent. thymol.—Apoth. Ztg., xxii (1907), No. 100, 1092.

*Somagen*, recommended as a nutrient and tonic remedy, is the name given to a meat-preparation, containing all the salts and nutrient substances of meat in an easily digestible form.—Pharm. Ztg., lii (1907), No. 89, 935.

*Soporval* is the name given to a weak-alcoholic fluidextract of valerian, prepared from the wild-growing drug after it has been stored up for two years.—Pharm. Ztg., lii (1907), No. 81, 842.

*Sorosin* (Sorisin) is the name of a specialty composed of the potassium salt of sulphoguaiacolic acid and orange syrup, which is recommended as a substitute for creosotal in the treatment of respiratory ailments of children. It is supplied in combination with iron and with arsenic under the names "*sorosinum ferratum*" and "*sorosinum ferroarsenatum*," but the proportions of these medicaments are not given. These preparations are said to be well tolerated, and are readily taken by children, although the taste of guaiacol is quite pronounced. The dose is half a teaspoonful to one teaspoonful, according to the age of the child.—Pharm. Ztg., lii (1907), No. 57, 595; from Therap. Monatsh., 1907, No. 7.

*Soryl* is the name given to a preparation recommended in eczemas and for foot-sweat. Its active component is designated as "formotannin-cellulose."—Pharm. Ztg., lii (1908), No. 49, 491.

*Soxhlet's Iron-Nutrient Sugar* ("Eisen-Nährzucker") is a white-yellow powder, readily soluble in water, having an agreeable odor and taste said to contain 0.7 per cent. of iron glycerophosphate in a mixture essentially composed of equal parts of maltose and dextrose.

*Soxhlet's Iron-Nutrient Sugar Cacao* ("Eisen-Nährzucker Kakao") is said to be a mixture of nutrient sugar, free from salt, 6 p., and powdered cacao, 1 p., with 10 per cent. of saccharated oxide of iron.—Pharm. Ztg., lii (1907), No. 95, 994; from D. *Ärzte-Ztg.*, 1907, No. 22.

*Spasmosit* is the name given to a "zwieback" containing bromides in place of common salt, which is recommended as a soporific and soothing remedy in the treatment of a great variety of ailments—Pharm. Ztg., lii (1907), No. 89, 935.

*Spirosal* is the name given to the monomethylglycolic-acid—salicylic acid-ester, which is recommended for the topical salicylic acid treatment.—Pharm. Centralh., xlviii (1907), No. 39, 810.

*Succinol* is the name given by the exploiters of *carboneol* and *carbo-terpin* (which see) to the purified amber-tar oil obtained by the dry distillation of amber. It is recommended as particularly effective in allaying itching in pruritus, psoriasis and eczema.—Pharm. Ztg., liii (1908), No. 9, 88; from Berl. Klin. Wschr., 1908, No. 3.

*Succinyl-Salicylic Acid*, the succinic acid ester of salicylic acid, has been obtained by condensation from succinic acid chloride and salicylic acid in the form of a whitish crystalline powder, having a faintly acid taste and melting at 176° C.—180° C. It is very sparingly soluble in water, but more readily in alcohol, acetone, and glacial acetic acid. Pharmacological and clinical experiments have determined its utility in all ailments in which salicyl-preparations are indicated, and its advantages due to superior tolerance. The compound is particularly recommended on account of its pronounced diaphoretic action in influenza, colds, and in inflammatory exudative processes, and is given in 1 Gm. doses several times daily to adults.—Pharm. Ztg., liii (1908), No. 23, 231.

*Sulfidal* is a new name for *Colloidal Sulphur* or "Sulfoid."

*Sullacetin* is the name given to a specialty designated by its exploiters as being a "potassium-sodium compound of pyrocatechinmonoacetic acid and of guanacolsulphonic acid." It is supplied in form of a white, odorless, feebly bitter powder and in the form of 0.5 Gm. tablets, and is recommended in tuberculosis and other affections of the lungs and throat.—Pharm. Ztg., lii (1907), No. 81, 842.

*Sullacetin* has been examined by Dr. F. Zernik, who finds that it is a



mixture of potassium sulphoguaiacolate and sodium pyrocatechinonacetate in nearly molecular proportions, but not, as is claimed, a definite chemical compound. The alkaline reaction of a solution of sullacetin is due to the presence of small quantities of alkali carbonate.—Apoth. Ztg., xxii (1907), No. 97, 1056.

*Sulfur Colloidale* is a gray-white powder, composed of 80 per cent. of sulphur and about 20 per cent. of albuminoid substances, which is soluble in water, forming a milky solution exhibiting a bluish fluorescence when viewed by transmitted light. The solutions must be freshly prepared, because sulphur is precipitated after some time—solution being effected by pouring the prescribed quantity of *cold* water on the powder, allowing to stand a few minutes, and then shaking the mixture vigorously. This colloidal sulphur is insoluble in alcohol, alcohol-ether, acetone, and concentrated solution of sodium chloride. It is precipitated from its aqueous solutions by alkali and ammonium salts, but the precipitates are redissolved on dilution with water. Albumen, serum and blood do not precipitate its solutions. With fats, lanolin, vaseline, wax and soaps, the preparation readily forms ointments in which the sulphur is extremely minutely divided, and which are far more effective in therapeutic action than when prepared with other forms of sulphur. The aqueous solutions of colloidal sulphur are considered particularly valuable for dermatological purposes. Pharm. Ztg., lii (1907), No. 76, 801; from Dermat. C.-Bl., 1907, No. 12.

*Sulfoid* is the trade-name under which the above-described "Sulfur Colloidale" is exploited by the manufacturers, who supply it in various combinations, such as ointments, pomades and soaps.—Ibid., No. 78, 823.

*Tannismut* is the protected trade-mark for bismuthum bitannicum.—Pharm. Centralh., xlviii (1907), No. 39, 810.

*Tannisol*, which was briefly mentioned in the report of 1906 (see Proceedings, 1906, 709) is a methyl ditannin obtained by the action of formalin on tannin. The two substances are heated together on the water-bath, when effervescence occurs, and a viscous mass is formed. This is dried, powdered, and exposed to a temperature of 45° C. to 50° C., to drive off excess of formaldehyde. It forms a red-brown, odorless, and tasteless powder, insoluble in most solvents, except alcohol and dilute alkalies. It is prescribed in intestinal catarrh as an astringent antiseptic, in doses up to 8 grains for adults, or 1½ to 4 grains for children. It is also used externally as a dusting powder, either alone or combined with other powder, or in the form of a 10 per cent. ointment or soap.—Pharm. Journ., May 16, 1908, 630; from Nouv. Reméd., 23 (1907), 224.

*Tannothymal* (Tannin-Thymol-Methane), mentioned in this report last year (see Proceedings, 1907, 740) as being exploited as an antidiarrhoeic remedy, is now described as follows: whitish-gray to reddish-gray, odorless, nearly tasteless (somewhat astringent) powder, melting with de-

composition when heated, giving off a faint odor of thymol, and burning up finally without leaving a residue. Almost insoluble in water, very difficultly soluble in ether and chloroform, also in acids, with the exception of strong sulphuric acid, which forms a brown solution, from which it is again precipitated on dilution. It is somewhat more soluble in alcohol. The alcoholic solution yields a gelatinous precipitate with lead acetate and is colored dark-blue on addition of ferric chloride. It is readily soluble in sodium hydroxide solution, the cherry-red solution becoming brown when heated.—Pharm. Ztg., lii, (1907), No. 66, 690.

*Tannyl* is the name given by E. Umber to a tannin compound of oxy-chlor-casein, which he recommends as an intestinal astringent in doses of 1–3 Gm. three times daily. It is a gray-brown powder, without pronounced taste, and insoluble in water, and may be administered dry or suspended in salep or oatmeal mucilage. The method of preparation is not given.—Pharm. Ztg., liii (1908), No. 25, 231; from Therap. d. Gegenw., 1908, No. 3.

*Tebean*, obtained as mentioned under “Antyase,” recommended as an immunizing agent and remedy in tuberculosis. It is supplied in two forms, the one for human treatment, the other for tuberculosis in neat cattle—the latter being specially designated as “bovo-tebean.” Both are administered subcutaneously.

*Tetrapol* is the name given to a liquid soap, described as containing 20 per cent. of carbon tetrachloride, 25 per cent. of “monopol soap” (? Rep.) and 55 per cent. of water.—Pharm. Ztg., lii (1907), No. 100, 1041.

*Theolactin*, which was mentioned in last year's report (see Proceedings, 1907, 740), is claimed by the manufacturer to be a definite compound, obtained by the reaction of molecular quantities of theobromine-sodium and sodium lactate, to which the following formula applies:  $C_7H_7N_4O_2Na \cdot CH_2CHOH.COONa$ . It is described as a fine, white, odorless powder, very soluble in water, and having a bitter, somewhat alkaline taste; it is quite hygroscopic, and its aqueous solution, which reacts alkaline, is rendered turbid by the action of the  $CO_2$  of the air. It must therefore be carefully protected from air and moisture. The therapeutic (diuretic) value of the compound depends largely upon the high theobromine content (57 per cent.), and in some degree also upon the sodium lactate. The dose is up to 1 Gm. three or four times daily, or even more frequently. Theolactin is a simple diuretic, free from untoward side-effects, and is well tolerated even by persons suffering with severe cardiac affections.—Pharm. Ztg., liii (1908), No. 23, 231.

*Thyreotheobromine* is a specialty which is supplied in form of pills, each containing, according to Mladejovsky, 0.05 Gm. extract of the thyroid gland and theobromine-sodium salicylate, with quinine and podophyllin.

These pills are recommended as an anti-fat remedy.—Pharm. Ztg., lii (1907), No. 67, 700; from Wien. Med. Wschr., 1907, No. 32.

*Tiodine* is an addition product, thiosinamin-ethyl iodide, obtained by treating thiosinamin with aethyliodide at the boiling-point. It forms colorless crystals, m. p. 68° C., which are readily soluble in water and in alcohol. Tiodine is recommended in arteriosclerosis, rheumatism, asthma, emphysema, scrofula, rachitis, syphilis, etc., and may be administered subcutaneously, intramuscularly, and per os. The dose per os is 0.1–0.2 Gm. several times daily; subcutaneously, a dose of 0.2 Gm. on alternate days.—Pharm. Ztg., liii (1908), No. 35, 351; E. Merck's Annual Rep., 1907.

*Torulin* is the name given to an active dry-yeast in a permanently stable form, which is recommended in staphylococci- and streptococci-infections, glanders, phlegmones and suppurating wounds in veterinary practice.—Pharm. Ztg., liii (1908), No. 49, 491.

*Trauben-Selecto-Ferment* is the name given to a yeast preparation, essentially composed of the active grape-ferment, which is exploited by a Swiss manufacturing firm for medicinal purposes.—Pharm. Ztg., lii (1907), No. 76, 801.

*Truon* is the name given to a paste, recommended for excessive sweating, which is composed of boric acid, formaldehyde and lanolin-paste. The proportions are not mentioned.—Pharm. Ztg., lii (1907), No. 84, 881.

*Tuberkel-Sozin*, a specialty recommended for the treatment of tuberculosis, is said to be obtained by extracting dry, autolized and de-fatted tubercular bacilli with glycerin at 37° C. and precipitating the glycerin extract with sodium-bismuth iodide.—Pharm. Ztg., liii (1908), No. 7, 70; from Berl. Klin. Wschr., 1908, No. 1.

*Tuberkulose-Diagnostikum-Höchst* is the name given to a preparation recommended for diagnosis by means of the tuberculin-ophthalmo reaction. It is prepared from tuberculinum Kochi (old-tuberculin) by precipitation with 95 per cent. alcohol and carefully drying the precipitate, and is supplied both in form of 1 per cent. solution and in form of powder.—Pharm. Ztg., lii (1907), No. 98, 1023.

*Varicin* is the name under which a bismuth-bandage is recommended for the treatment of ulcers on the lower leg, varicose veins, etc.—Pharm. Ztg., liii (1908), No. 42, 419.

*Velledol* is the name given to the active principle of the mistletoe (*Viscum album*), which is recommended, in doses of 0.05 Gm., internally (or 0.00 Gm. subcutaneously), several times daily, for menstrual disturbances, arteriosclerosis, etc.—Pharm. Ztg., liii (1908), No. 3, 26.

*Veronal*, which had been taken in a poisonous dose (10 Gm.), was found by G. and H. Frerichs in the urine as well as in various organs of

the body. From the urine it was extracted as follows: The urine was shaken with repeated quantities of ether until, on evaporating a little of the solvent, no residue remained; the united ethereal liquids were evaporated, and the residue was taken up with boiling water; the solution thus obtained was decolorized by means of animal charcoal, and concentrated. On cooling, crystals having the properties of veronal, were deposited. In this particular case the amount obtained was 0.195 Gm. from 448 Cc. of urine, and the stomach of the patient had been washed out an hour and a half after administration of the drug.—Pharm. Journ., May 9, 1908, 596; from Rev. Pharm., Feb., 1908, 50.

*Vesol-Pastilles*, recommended as an anti-fat remedy, are said to contain the active constituents of *Phytolacca decandra* and *Fucus vesiculosus*.—Pharm. Ztg., lii (1907), No. 67, 700.

*Xaxaquin* is the name given to the quinine salt of acetylsalicylic acid which, it is claimed, combines the antiseptic action of quinine with the antirheumatic and analgetic properties of salicylic acid, without producing unpleasant secondary effects. The specialty is supplied in form of 3-grain tablets, one of these being a dose in case of influenza, neuralgia, and painful conditions in general.—Apoth. Ztg., xxiii (1908), No. 21, 207; from Therap. Neuheiten, 1908, 95.

*Xeranolbolusgaze* is the name given to a bandaging material (gauze) in which white clay (bolus alba) is introduced by boiling, the material being sterilized at the same time (D. Aerzte-Ztg., 1907, No. 19). Attention is directed in this connection to the suggestion of Dr. Aufrecht, made several years ago, that white bole be used for preparing a bandaging material and that Cohn described a method for its preparation (see Proceedings, 1906, 615), which may throw some further light upon the gauze supplied under the above name. According to this, the white bole, after being heated to redness and finely pulverized, is incorporated with a hot solution of ammonia soap, to which 0.5 per cent. of salicylic acid or 1 per cent. of liq. alumin. acet. is added, and absorbent gauze then saturated with this mixture.—Pharm. Ztg., lii (1907), No. 84, 881.

*Xerosin* is the name given to an antiseptic drying paste, having the color of the skin, which is readily removed by washing. It contains beside the skin-varnish, known as "galanthum," ichthyol, boric acid, zinc oxide and talc.—Pharm. Ztg., liii (1908), No. 19, 192.

# MATERIA MEDICA.

## GENERAL SUBJECTS.

*Plants—Immunity to Disease.*—F. E. Weiss delivered an interesting address on the immunity to disease among plants before the British Pharmaceutical Conference at Manchester in 1907 which has some practical bearings on the cultivation of medicinal as well as economic plants, by pointing out some of the facts now known about the incidence of disease among them and the theories which have been advanced as to the cause of immunity which some species and varieties exhibit to various diseases. He says that, roughly speaking, we may distinguish between climatic and infectious diseases of plants, the former being produced by unfavorable conditions of temperature, of rainfall, and of physical and chemical nature of the soil; the latter are produced mainly by vegetable and animal parasites. Plants exhibit different degrees of resistance to these conditions, and if this resistance can be increased it may often be turned to commercial advantage. With this in view experiments have been made in the direction of nutrition and protection; and as regards the effect of frost, young plants being more susceptible than mature plants, all the experiments have been made on lines of getting the plants to mature quickly, so that they can resist the autumn frosts, or to retard the production of foliage to guard against the spring frosts. Methods of cultivation, drainage of soil, the judicious use of manure, have been tried with good success, but the best results have been obtained by the selection of frost-resisting varieties. In this way varieties of plants are obtained that can be grown in high latitudes, as exemplified by the results of experiments conducted by our fellow-member, Mr. Wm. Saunders, on the Canadian experimental farms, by crossing normal apples with the Siberian crab-apple. As regards diseases, these are usually due to vegetable parasites, which exhibit an exceedingly selective action, attacking usually only a particular order, genus, or species of plant. As shown by Dr. Marshall Ward's investigations on the brown rust of grass, this selective action is not due to structural peculiarities, but to physiological causes. Infection and resistance to infection depend on the power of the fungus protoplasm to overcome the resistance of the host by means of enzymes and toxins; and reciprocally on the protoplasm of the cells of the host to form anti-bodies which destroy such enzymes or toxins, just as is the case with resistance of animal organisms to their bacterial foes. These substances are of the nature of antitoxins, and in cases where natural immunity does not exist or is doubtful, this can be secured or augmented, as in animals, by the injection of certain toxins or by preventive drugs, among which, sulphate of copper, in particular, has proven very effectual under proper selection. The author concludes that breeders

have the power by careful selection of the parent plants to combine disease-resisting power with relatively great fertility, and that therein lies the hope for future success.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1907, 411-415.

*Medicinal Plants of North America—Botanical and Morphological Description.*—Theo. Holm has communicated during the past year a series of papers on North American medicinal plants, in which he comprehensively describes their characteristic botanical and morphological structure, the text being profusely illustrated by well-executed cuts. The author's description cannot be profitably condensed and must therefore be referred to in the original papers, which include the following plants :

*Cunila Mariana*, L. (dittany, stone mint, wild basil, sweet horsemint).—Merck's Rep., July, 1907, 188-189.

*Erythronium Americanum*, Ker. (scrofula root, yellow snowdrop, yellow adder's tongue, adder leaf, dog violet, rattlesnake violet).—Ibid., Aug. 1907, 223-225.

*Podophyllum Peltatum*, L. (mayapple, mandrake, hogapple, wild lemon, ground lemons, raccoon berry, ducksfoot, peca).—Ibid., Sept., 1907, 250-252.

*Aristolochia Serpentaria*, L. (snakeroot, Virginia snake root, snake-weed root, birthwort, viperine).—Ibid., Oct., 1906, 276-279.

*Phytolacca Decandra*, L. (poke, pocan, coakum, garget berries, pigeon berries, chongras, jucato (in Jamaica), and, in Mexico, cuechilitz).—Ibid., Nov., 1907, 312-314.

*Lobelia Inflata*, L. (Indian tobacco, wild tobacco, emetic weed, puke weed, asthma weed).—Ibid., Dec., 1907, 341-343.

*Gaultheria Procumbens*, L. (wintergreen, partridge-berry, goose-berry, box-berry, deer-berry, Jersey tea, checker-berry, ground holly).—Ibid., Jan., 1908, 1-3.

*Liquidambar Styraciflua*, L. (sweet gum).—Ibid., Febr., 1908, 31-34.

*Cypripedium Pubescens*, Willd. (larger yellow lady's slipper, yellow moccasin flower, yellow Noah's ark, Venus' shoe, male nervine, American valerian, yellow umbil).—Ibid., March, 1908, 60-62.

*Gelsemium Sempervirens*, Ait. (yellow jessamine).—Ibid., April, 1908, 86-89.

*Hedeoma Pulegiodes*, Pers. (pennyroyal, American pennyroyal, mock pennyroyal, squawmint, mosquito plant).—Ibid., May, 1908, 115-117.

*Medeola Virginiana*, L. (Indian cucumber, cucumber root).—Ibid., June, 1908, 147-148.

*Medicinal and Poisonous Plants of California—Brief Notes.*—Prof. Albert Schneider publishes an extensive series of brief notes on the medi-

cinal and poisonous plants of California, arranged in alphabetical order according to species, in the "Pacific Pharmacist" (vol. I). The total number of plants considered in this volume comprises 282 species, which must necessarily be referred in the original, beginning in the July number of the Pacific Pharm., 1907, and ending with the April number, 1908.

*Plants Used By Indians and The Early Spanish Settlers in California—Interesting Data.*—E. E. Johnson communicates some interesting data concerning some plants (53 species) used by Indians and the early Spanish settlers in California, which he collected from histories of early days in California, and through verbal reports from the relatives and friends of Spanish physicians who practiced medicine in California long before the discovery of gold. These data, being communicated in brevity, cannot be further condensed, and must therefore be consulted in the original, in The Pacific Pharmacist, Dec., 1907, 411-415.

*Plants Containing Cyanogenetic Glucosides—Interesting Grafting Experiments.*—L. Guignard communicates some interesting results which he obtained by grafting experiments with plants yielding cyanogenetic glucosides. Such plants are specially suitable for these physiological experiments, since the role played by the glucosides in the nutrition of the plant is fairly well known, and hydrocyanic acid is readily detectable in traces by simple chemical tests. It is found that when *phaseolus lunatus* yielding prussic acid is grafted on the ordinary French bean, containing none, or *vice versâ*, that there is no transference of cyanogenetic glucosides from stock to graft, or from graft to stock, as the case may be. Among the Rosaceæ, which possess the common physiological faculty of elaborating cyanogenetic glucosides, there is also no migration of glucosides from graft to stock or inversely, unless these represent two species of the same genus and contain the same glucoside. Notwithstanding the interchange of matter which takes place for the nutrition and development of the graft, certain organic constituents remain localized in one or other of the individuals so united. In the artificial symbiosis of grafting each species retains certain chemical constituents peculiar to its autonomy.—Pharm. Journ., Feb. 8, 1908, 151; from Compt. rend. 145 (1907), 1376.

*Vegetable Drugs—Some Neglected Plants.*—Attention is directed in the Journal of Therapeutics and Dietetics (Oct., 1907), to several vegetable drugs, including *Collinsonia canadensis*, *Berberis aquifolium*, and *Chelidonium majus*, which deserve to be more widely used. *Collinsonia canadensis* (or stone root) should be used in the green state. It is particularly valuable in some forms of sore throat, that caused by constant use of the voice, commonly known as "clergyman's sore throat," being invariably benefited by the drug. It is useful also in hæmorrhoids, irritated conditions of the intestinal tract, and in diseases of the heart. It acts on the tissues and valves of the heart by relieving irritation, increasing the power

of its muscular action, and regulating the muscular contraction. *Berberis aquifolium* (or mountain grape) is a valuable alterative, tonic, anti-spasmodic, and anti-malarial agent. It has been successfully used in syphilis, glandular indurations, chronic ulcers, chronic tonsillitis, incipient phthisis, chronic dyspepsia, and other disorders, particularly in cases where it is desired to stimulate the metabolic processes. It is prescribed alone or with phytolacca, echinacea, and the iodides. The mixture is given in doses of 1 to 10 minims. *Chelidonium majus* (or celandine) is recommended in diseases of the liver, particularly in conditions resulting from sluggishness of the portal circulation. In doses of 15 minims the tincture has proved very valuable in the treatment of biliary calculi.—Pharm. Journ., Jan. 25, 1908, 89.

*Vegetable Drugs—New Adulterations and Substitutions Observed on the French Market.*—Perrot directs attention to a number of adulterations and substitutions which he has observed in the French drug market, among which the following have not heretofore been noticed :

*Linden Flowers*, mixed with the flowers of *Tilia argentea*, which have a markedly dissimilar odor.

*Jaborandi Leaves*, adulterated up to the amount of 30 per cent. with the leaves of *Swartzia decipiens*, together with the leaves of *Pilocarpus* species, possessing little or no activity, and also with genuine jaborandi leaves, from which the pilocarpine had evidently been extracted.

*Broom Flowers* (from *Spartium scoparius* or *Sarothamnus scoparius*), mixed with the flowers of the so-called "Spanish broom" (*Spartium junceum*), which possess poisonous properties.

*Hydrastis Rhizomes*, mixed with the roots of *Plantago* species and moneria bark (from *Chrysophyllum glycyphoeum* ?).

*Sarsaparilla*, containing besides well-known adulterants also the roots of *Smilax medica* and other roots indigenous to southern France.

*Savin Tops* are in France almost completely substituted by the tops of *Juniperus phoenicea*, the activity of which is materially inferior to that of the genuine drug.—Pharm., Ztg. lii (1907), No. 80, 841; from Rép. de Pharm., 1907, No. 9.

*Commercial Crude Drugs.—Variation in Activity.*—F. H. Carr and W. C. Reynolds show from their own experiments, and from the published statements of other workers, that climate, soil, time of harvesting, and method of drying all effect the activity of drugs, and, since these factors are in most instances beyond the control of the purchaser, the great importance of chemical and physiological standardization. They have shown that large variations occur in the activity of those drugs which they were able to submit to chemical or physiological assay, and that these variations cannot be foretold by examination of physical properties. Since



they occur in these cases, so must they be assumed to exist in those beyond our control, and this should encourage each one to contribute, so far as he is able, to the extension of that boundary which lies between drugs of known chemical constituents and those unknown. The following tabulated results of analysis show the highest and lowest observed percentages of active ingredients in a number of drugs which had previously been selected as of apparently good quality :

Drug.	Lowest Observed Percentage.	Highest Observed Percentage.	Active Principles Determined.
	Per cent.	Per cent.	
Aloes Curaçao .....	12.6	27.9	Aloin.
<i>Atropa Belladonna</i> Root ....	0.29	0.55	Total alkaloid.
<i>Atropa Belladonna</i> Dried Herb .....	0.23	1.08	Total alkaloid.
Broom Tops ( <i>Cystisus scopari- us</i> ) .....	0.07	1.06	Sparteín sulphate.
Calabar Beans ( <i>Physostigma venenosum</i> ) .....	0.04	0.27	Eserin.
<i>Cinchona Succirubra</i> .....	1.06	4.64	Quinine and cinchonidine.
	2.7	8.3	Total alkaloid.
Coca Leaves .....	0.018	0.79	Pet. ether sol. alkaloid.
Colchicum Seed .....	0.12	0.57	Colchicine.
<i>Hydrastis Canadensis</i> Root {	1.14	3.17	Hydrastine.
	2.03	5.8	Berberine sulphate.
<i>Hyoscyamus Niger</i> Leaves ...	0.06	0.21	Total alkaloid.
<i>Pilocarp. Jaborandi</i> .....	Too small to estimate.	0.05	Pilocarpine nitrate.
<i>Pilocarp. Microphyl</i> .....	Too small to estimate.	0.99	Pilocarpine nitrate.
Pomegranate Root Bark .....	0.12	0.29	Total alkaloid.
<i>Ipecacuanha</i> Root .....	1.76	2.77	Total alkaloid.
<i>Ipecacuanha</i> Root (Rio) ..	0.98	1.83	Emetine.
	0.48	1.29	Cephaline.
Jalap ( <i>Ipomæa Purgr</i> ).....	5.1	15.8	Resin.
<i>Leptandra Virginica</i> .....	6.9	12.6	Oleo resin.
<i>Nux Vomica</i> Beans .....	0.81	2.0	Strychnine.
<i>Podophyllum Peltatum</i> .....	3.80	6.65	Resin.
Scammony Root .....	7.75	10.8	Resin.

The significance of these figures become apparent when it is considered that, however carefully and accurately the pharmacist may be dispensing a preparation, it may in reality contain only a fraction of, or many times the activity required. The remedy is no doubt the standardization of the galenical preparations.—Pharm. Journ., April 25, 1908, 542-544.

*Crude Drugs—Adulterations and Substitutions.*—A. O. Farwell calls attention to adulterations and substitutions observed in the following crude drugs offered: *Althaea*, beech drop (*Epiphegus virginiana*, Bart.), berberis aquifolium, black cohosh, black walnut bark, blue flag, burdock, buchu, cubebs, culver's root, dittany, frostwort, ginseng, horsemint, ipecac,

lobelia, lady's slipper, marigold flowers, osha, or Colorado cough root (an *Umbellifera*, offered as angelica), pareira brava, pennyroyal, pink root, pipsissewa, sage, scutellaria, senna, stargrass (*Aletris farinosa*, L.), wild cherry, uva ursi, viburnum (black haw), wahoo, water avens, water pepper (*Polygonum punctatum*, Ell.), white birch leaves, white clover, white poplar bark, wintergreen, yarrow, and yellow root (*Xanthorrhiza apiifolia*, L. Her.).—Merck's Rep., Feb., 1908, 34-35.

*Drugs and Chemicals—Adulterations and Inferiorities found in Practice.*—L. Henry Bernegau draws attention to some examples of adulterations and inferiorities of drugs and chemicals taken from actual laboratory records as noted within a recent period of a few weeks. *Stramonium* contaminated with *Hyoscyamus* capsules and seeds, probably also with leaves, the drug being very dry and much broken up, and consequently the identification difficult. *Conium* leaves received during the past year or two were either entirely inert or contained only small traces of coniine. The leaves were evidently not adulterated, their inferiority being doubtless due to carelessness in harvesting. If packed too hard in the sacks in which the leaves are carried from the field, considerable heat results within a few minutes, resulting in the evaporation or decomposition of the coniine. *Powdered licorice root* showed the microscopic characteristics of glycyrrhiza in five samples; a sixth sample showed a peculiar color of the wood fibre and a scarcity of crystals of calcium oxalate. This yielded only 20 per cent. of extractive, whereas the other five samples yielded up to 40 per cent. To the naked eye and in some degree to the taste, it was not distinguishable from the other samples, but evidently the powder was prepared from partly exhausted roots. *Ergot* is often worm-eaten, and some samples are really alive with vermin. Good ergot should assay at least 0.15 per cent. of total alkaloid (cornutine of Keller); some samples recently assayed only 0.03 per cent. and one as little as 0.015 per cent. Some samples of commercial *Sanguinarine Nitrate* assayed 51.4, 61.2, 75.3 and 89.5 per cent. respectively. While the commercial salt is not supposed to run 100 per cent., these variations are so great that manufacturers should state the true percentages on the label. Very few samples of *Resin of Podophyllum* came up to the U. S. P. requirement; most of them contained 10 or more per cent. of alcohol-insoluble matter. *Powdered Castile Soap*, sold as "pure olive-oil soap," in a large percentage of samples contained large amounts of animal fats. *Zinc Permanganate*, entirely soluble in water, as it should be, has in recent months been unobtainable. The best contained 8 per cent. of insoluble matter, and one sample as much as 32 per cent. *Gold and Sodium Chloride*, which should assay 30 per cent. of metal, mostly ran between 28 and 28.8 per cent., one sample as low as 24.6 per cent.—Amer. Journ. Pharm., May, 1908, 221-225.

*Powdered Drugs.—Sophistication with Exhausted Material.*—In a re-

port on the examination of powdered drugs, John Lothian describes the deficiencies observed in a number of powdered drugs, which were due to the partial or complete exhaustion of the constituents upon which their medicinal value depends: *Powdered gentian*, having hardly any taste; powdered *African ginger*, consisting of spent ginger marc, treated with capsicum essence and mixed with genuine African ginger; powdered *Cascarilla* bark, deficient in extractive, and containing 25 per cent. of ash; powdered *Licorice*, of a dark color, suggesting something wrong, and showing numerous cork cells under the microscope; *Cinnamon* bark, in the usual fine quills, but containing only a trace of volatile oil.—Pharm. Journ., May 2, 1908, 566.

*Powdered Drugs.—Analytical Scheme for their Microscopic Examination.*—In continuation of his series of papers giving the details of an analytical scheme for the microscopical examination of powdered drugs, begun in Merch's Report of July, 1900 (see Proceedings, 1901, *et seq.*) and supplied in monthly installments with more or less regularity since then, Burt. E. Nelson communicates in the July number, 1907, of the same Journal (p. 191-192) an "Analytical Key," which is to serve for the identification of the different powders classified on the basis of their colors and pronounced physical appearance. This is the only installment appearing since the last report was made, but the subject is not completed and its continuation is evidently intended.

*Drug Assaying.*—A mechanical agitator for drug assaying is figured and described by C. E. Parker in the "Proceedings" of this Association, 1907, 497-499.

*Ash in Some Common Drugs—Determination of Abnormally Large Content.*—Albert F. Judd has determined the ash in a number of drugs, and found it abnormally large in some instances. In *asafetida*, for example, he found as high as 37.2 to 76.6 per cent., but this was due to an adulteration with gypsum; a sample of *aloes* was found to yield 26.5 per cent. of ash; powdered *capsicum* yielded 15.2 and 18.4 per cent., largely due to adulteration with red lead; *black pepper*, yielding 12.9 to 18.3 per cent. of ash, mainly silicates.—Proc. Pa. Pharm. Assoc., 1907, 259-260.

*Ash of Drugs—Importance of Determining the Alkali-Content.*—F. H. Alcock draws attention to the fact that the nature of the ash of drugs has not received that amount of attention it deserves, particularly as regards the determination of alkalies. This, in his experience, is not easily performed where a high degree of accuracy is required. He recommends a modification of the lead process of Fresenius, substituting, however, the proper quantity of liquor plumbi subacetatis, B. P., for the lead salt directed. The results come out well, and can be repeated with accuracy

to the second place of decimals.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1907, 399-401.

*Ash in Organic Drugs—New Method for Determining its Alkalinity.*—In order to obviate the error introduced by the presence of phosphates in the alkalimetric valuation of ash of organic substances, H. Farnsteiner recommends the following method: From 0.20 to 0.30 Gm. of the ash is boiled for about three minutes with 20 Cc. of  $\frac{N}{2}$  hydrochloric acid and 40 Cc. of water. After cooling, the mixture is transferred to a graduated cylinder and treated with 5 Cc. of a solution containing 5 per cent. of fused calcium chloride and 10 per cent. of ammonium chloride, and finally with 20 Cc. of  $\frac{N}{2}$  ammonia solution. The volume is then adjusted to 100 Cc., and the mixture is allowed to stand for twelve hours. Fifty Cc. of the clear solution is then decanted and titrated with  $\frac{N}{10}$  hydrochloric acid, using methyl orange as indicator. The results obtained are generally much lower than those obtained by the direct titration of the ash, which contains much pyrophosphates.—Pharm. Journ., Aug. 31, 1907, 316; from Zeit. f. Unters. d. Nahr. u. Genussm.

*Ash Determination of Drugs—Color no Positive Criterion of Identity.*—The investigation of B. Hafner and F. Krist lead to the conclusion that in the ash determination of drugs, its color alone gives no conclusive evidence of identity, as is apparently assumed in the Pharm. Austr. VIII, when defining that certain drugs yield a white or gray-white, brown, green, etc., ash on incineration. The color of the ash depends largely on the temperature employed for the combustion. The green color of the ash, although generally referable to the presence of manganese, is also not a positive criterion for its presence. Moreover, manganese is so universal a constituent of vegetable drugs (the authors found it in 157 different drugs out of 164 examined), that its mere presence can only serve as confirmatory evidence of identity. Among the drugs examined, belladonna leaves, digitalis and cannabis indica contained the highest percentages of manganese.—Pharm. Ztg., lii (1907), No. 66, 689; from Ztschr. d. Oesterr. Ap.-V., 1907, No. 27 and 28.

## A. VEGETABLE DRUGS.

### ALGÆ.

*Fresh Water Algæ—Saccharine Constituent.*—Mirande noticed that a growth of algæ of the genus *Zygnema*, prevalent on the banks of a stream in the neighborhood of Montpellier, was very attractive to bees. On examination, it was found that the algæ were characterized by extensive gelatinous formative around their external cells, so that they seemed to be immersed in a thick mucilage. This mucilagenous matter proved to be a carbohydrate, closely allied to glucose, while a notable amount of the

same sugar is also present in the plants themselves.—Pharm. Journ. Jan. 4, 1908, 9; from Jour. de Pharm. et Chim., 26, (1907), 563.

## BACILLARIE.

*Bacteria*.—*Phosphorus a Constituent of the Fatty Matter*.—E. Alilaire has found the fatty matter of all the bacteria examined by him, with the single exception of *Chlorella vulgaris*, to contain considerable quantities of phosphorus. The bacillus of glanders contains as much as 8 per cent. in terms of  $H_3PO_4$ , while the bacteria of diphtheria and Nocard's bacillus of lymphangitis contain least, with 0.5 per cent. The exception, *Chlorella vulgaris*, yields more fat than any other species, but, as it contains chlorophyll, it is distinctly different from other bacteria.—Pharm. Journ., Jan. 11, 1908, 31; from Compt. rend. 145 (1907), 1215.

## FUNGI.

*Pure Yeast Cultures*.—*Significance in Industrial Fermentation Processes*.—P. Arauner interestingly reviews the development of our present knowledge of the fermentation processes, with particular reference to the functions which yeast exercises, in its various forms and conditions of vitality, in the manufacture of vinous liquors. The author, furthermore, describes the methods of producing the various forms of pure yeast cultures (these forms being shown in various conditions of development and kind by a series of cuts embellishing the text), by means of which wine-must is subjected to fermentation with far greater certainty and convenience than by the older methods of autò-fermentation, which are so frequently attended by troublesome complications.—Pharm. Ztg., lii (1907), No. 63, 660-662.

*Russian Ergot—Apparent Superiority Compared with Ergots Produced Elsewhere*.—D. A. Ruffmann (St. Petersburg) and Thomas Maben contribute a comprehensive paper on the production, collection and trade in Russian ergot, in the course of which they discuss the comparative quality of ergots from different sources, the effect of age on the fungus, tests of quality, etc. This paper may be considered to be a résumé of our knowledge on the subject of ergot, and deserves the more attention in view of the greatly increased favor in which this drug is again being regarded by medical men. Concerning the quality of Russian ergot, the authors say that the best ergot is found in the south of Russia, where it is small, but contains more alkaloid; in Siberia it is very large and pretty, but much poorer in alkaloid. According to Keller, the alkaloidal content of ergot grown in different countries, is as follows: Russian ergot contains 0.245 per cent. alkaloid; Austrian ergot contains 0.225 per cent. alkaloid; Spanish ergot contains 0.205 per cent. alkaloid; German ergot contains 0.13 to 0.157 per cent. alkaloid; Swiss ergot contains 0.095 per cent. alkaloid. Dohme found the mean percentage of cornutine in samples

examined by him, by Keller's process, to be—Spanish, 0.29 per cent.; Russian, 0.18 per cent.; and German, 0.15 per cent. Beckurts determined the proportion of cornutine by a different process, and his results approximate closely with those of Keller, namely, Russian, 0.19 per cent.; Austrian, 0.187; Spanish, 0.136; Bavarian, 0.127; and Swedish, 0.046. Beckurts' samples were dried simply by exposure over quick-lime, without the application of heat, which method of drying he regards as the only one admissible for this drug. The balance of authority, therefore, appears to be in favor of regarding Russian ergot as the best. Regarding the alkaloid itself, Keller came to the conclusion that ergot contains only one base, and that Kobert's cornutine, Tanret's ergotinine, and the picrosclerotine of Dragendorff and Podwyssotski were all identical or somewhat altered forms of the same substance. The sphacelotoxin or spasmotin of Jacoby is considered by him to owe its activity to the presence of cornutine. Few drugs have received greater attention at the hands of chemists than ergot, and, so far, with still fewer has less result been obtained. Quite recently claims have been put forward on behalf of clavin, which, according to Cushny, is inert, and ergotoxine, which is stated by the B. P. Codex to produce little or no action on the heart, whilst galenical preparations of whole ergot stimulate that organ. According to the Codex, "no method of standardizing ergot by chemical means is at present known." But while the chemistry of ergot is still obscure, its pharmacology is well understood, and consequently its therapeutic value has been placed on a definite foundation. It is probably not realized so fully as it ought to be how much this value depends on the freshness of the drug. Kobert proved that ergot collected two or three weeks before the rye is thoroughly ripe, is conspicuous by its stronger pharmacological action. As time goes on this action becomes weaker, and Grunfeld states that ergot, when tested four months after it has been collected, has considerably less activity than fresh ergot. After eight or nine months the therapeutic action is almost nil. In view of this the Russian Pharmacopœia demands that the Russian pharmacist should lay in a stock that will last for not more than one year.—Pharm. Journ., Feb. 29, 1908, 247-249.

*Tillaria Tritici*—A Poisonous Grain-Smut.—G. W. Chlopin, in contradiction to the opinion expressed by the Biological Section of the Moscow Public Health Association, that grain infested by grain-smut *Tillaria tritici*, is devoid of poisonous action when consumed, points out that this opinion is not supported by the evidence found in the literature. *Tillaria tritici* is a parasitic fungus infesting wheat grains, containing small, transparent, dark brown spores, and communicating to the grain a disagreeable odor reminding of spoiled herrings. The infested grains retain their normal shape, but are lighter than water, and enclose numerous spores in the thin, friable seed-coat, producing a malodorous flour of a dirty color. Most authors who have recorded their experience with wheat so infected,

regard its consumption by animals as noxious, and toxic effects must also result if the flour prepared from it is consumed by man. In fact there are a number of serious cases of wholesale poisoning on record, which have been traced to the presence of this mould. While, therefore, the author regards the injurious properties of the mould to be beyond doubt, the question that requires investigation is whether the spores themselves are directly poisonous, or whether they incite by their presence the formation of ptomaine-like bodies in the flour.—Pharm. Ztg., lii (1907), No. 100, 1040; from Russ. Arzt., 1907, 469.

## LYCOPODIACEÆ.

*Lycopodium*—*Exaggerated Estimations of Impurities and Sophistication*.—In view of the numerous unfavorable criticisms concerning the commercial quality of drugs, it is refreshing to note an optimistic view held by a correspondent, "Dr. W." of the Pharm. Ztg. with regard to the unsatisfactory quality and sophistications of lycopodium that have frequently been noted recently. He says that on close examination, such findings will often prove inadmissible, or at least exaggerated. In the examination of lycopodium the water and chloroform tests are of subsidiary importance; they serve solely as preliminary tests for a prohibited content of starch and mineral matter, such as sand, sulphur, gypsum, etc. The presence of sand, which is unavoidable within certain limits even when the lycopodium has been double and triple sifted through the finest silk sieves, if excessive in quantity is revealed accurately by the ash determination prescribed by the Pharmacopœia. But the reliability of the findings is chiefly dependent on the microscopic examination, which under observance of proper care reveals the presence of accidental or added impurities; for the characteristic form of the lycopodium spores is plainly distinguished from impurities or sophistications, with the possible exception of the pollen of *Pinus* or of *Corylus* (filberts), if, for example, accidental aggregations of several (3-5) of the roundish-pyramidal lycopodium spores are formed in the microscopic field, thus assuming the size and puffy shape of the fir-pollen.—Pharm. Ztg.

## FILICES.

*Aspidium Marginale* and *Osmunda Claytoniana*.—Henry Kraemer contributes a paper in which he gives a general description of these two ferns, together with the anatomy of the rhizomes, roots and stipes, in the "Proceedings" of this Association, 1907, 345-351.

## PALMACEÆ.

*Carnauba Palm*—*Slow Development*.—Gehe & Co. mention in their spring Report (1908) that the carnauba palm grows almost exclusively in the state of Ceara, one of the driest districts of Brazil. It takes decades before the leaves of this plant are developed sufficiently for the collection

of carnauba wax. During this prolonged period the tap-root reaches deeper and deeper into the ground, which enables the plant to absorb moisture from the lower layers of the earth, and thus makes the palm comparatively independent of the periodical rainfall.—Pharm. Ztg., liii (1908), No. 31, 312.

## SIMILACEÆ.

*Sarsaparillas—Characters of Distinction.*—C. Hartwich discusses the uncertainty of the characters of distinction proposed for the identification of the different commercial sorts of sarsaparilla, and points out that many of the characteristics upon which heretofore great reliance has been placed have in the course of time become unreliable. Among these, particularly, the character of packing and the designation of source can no longer be depended upon. The anatomical structure is the chief factor that should be considered, since the anatomical features are the only ones that permit the reliable characterization of the root. While this view conflicts with that of Arthur Meyer, who regards the external appearance of the drug and the packing as the chief distinguishing characteristics of commercial sarsaparillas, and believes that commercial designation on the basis of their anatomical structure can lead only to greater confusion, Hartwich insists that there are a number of anatomical characters of distinction, such as are found in the starch-bearing portions, oxalate cells and endodermis, which serve well for the commercial characterization of the drug. He points out that in the scientific literature and the pharmacopœias the sarsaparillas usually mentioned are the Mexican and Central American drugs: "Honduras," "Vera Cruz," both readily distinguished from each other; "Tampico," according to structure to be placed with Honduras, or again with Vera Cruz; and the uncertain "Mansanilla" or "Guatemala" sarsaparilla. To these also belongs the "Nicaragua" sarsaparilla, recently described by the author, which resembles the Honduras drug most nearly, but is distinguished from this by the decidedly greater thickening of the endodermal cells and of the hypodermal cells. Three other sarsaparillas received from Mexico are also described by the author, which are designated as being derived from Central America. They differ, however, from those before mentioned very distinctly, and give support to the author's opinion that the varieties of sarsaparilla are more numerous than has heretofore been assumed.—Apoth. Ztg., xxii (1907), No. 65, 679; from Ber. d. D. Pharm. Ges., 1907, No. 6.

## LILIACEÆ.

*"Guaco"—Indefinite Application of the Name in South America.*—O. A. Farwell mentions that there has always been some question as to the identity of "guaco," the name being applied in South America to many different plants. The leaves have been supposed to come from *Mikania guaco*, K. B. K., and the roots from some species of *aristolochia*, *crataeva*,



etc. A sample of fresh living roots received under the name of "guaco" years ago from Mexico were planted, and having now flowered were identified as one of the American aloes, *Agave planifolia*, Wats. It had a rosette of root leaves, which were oblong or lanceolate, spiny-edged, and deep-green mottled with white; the scape was a foot or two high and well covered with bracts, the lower two or three of which resembled the root leaves in color and shape, but were many times smaller; the flowers were quite numerous on the upper third of the scape, were of a pale or livid greenish color, and somewhat horizontal or drooping.—Drugg. Circ., July, 1907, 459.

## AMARYLLIDACEÆ.

*Buphane Toxicaria* (*B. Disticha*)—*A South African Medicinal Plant.*—Directing attention to the photo-engraving accompanying his paper on *Buphane disticha* or *B. toxicaria*, G. E. Oliver remarks that any South African will at once recognize the illustration as that of a familiar object on the open veldt, though by no means plentiful in any one spot. It is not usual, however, to see the flower and leaves flourishing at the same time. The bulb stands halfway out of the ground, and collectively the leaves when fully developed assume the shape of an open fan. The flowers, which are the first to appear, are in a dense head, supported on a stout stem, and are of a fleshy pink color and sweet-scented. When the petals wither the individual stalklets, each terminated by a seed-vessel, continue to elongate until, when dry and ripe, the general outline is spherical, and the whole mass detaches itself from the parent stalk and is blown over the veldt, rolling over and over and scattering its seeds broadcast. The bulb itself consists of innumerable layers of a thin transparent silky tissue, which assume a magenta color when separated and exposed for some time to the air. It is firmly attached to the soil by a short thick rootstock, which gives off very long tough rootlets that penetrate deeply. The chief use of the plant by natives is as a protection tissue after circumcision, for which purpose the thin silky nature of the bulb-coats renders it specially adaptable. It does not appear to be applied on account of any healing properties, but merely as a protective, as only the outer and drier layers are used. Its Kaffir name is *in-Cwadi*, from the resemblance of the numerous coatings of the bulb to the leaves of a book, and its Dutch name *gift bol* = poison-bulb. Chemically examined, it is found to contain starch and a large quantity of mucilaginous matter. Its poisonous principle, however, is aconitine (not brucine, as stated by Smith in his "South African Plants," 2nd edition), which can be extracted with suitable solvents, and gives the characteristic tingling and numbing sensation to the tongue.—Chem. & Drugg., Jan. 25, 140.

## IRIDEACEÆ.

*Saffron—Composition of Genuine and of Adulterated Samples.*—Albert

E. Parker has determined the composition of five adulterated samples of saffron submitted to him for this purpose, and, for comparison, also examined two samples of "Valencia" saffron obtained from perfectly reliable sources. The results are shown in the following tables :

ADULTERATED SAFFRON.

—	A.	B.	C.	D.	E.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Ash, total .....	37.90	14.90	37.75	26.15	20.10
Ash, insoluble in water .....	34.70	1.70	1.65	15.80	5.45
Ash, insoluble in HCl, diluted ..	33.10	0.50	0.10	10.70	1.25
Alkalinity of ash .....	0.5 Cc.	15.8 Cc.	40.0 Cc.	6.25 Cc.	13.5 Cc.
Loss on drying at 100° C. ....	12.00	13.90	14.00	12.90	13.80
Cold-water extract .....	36.70	58.50	77.00	41.50	57.50
Ash of extract .....	3.80	14.10	33.60	10.90	16.30
Woody fiber .....	—	—	—	4.65	6.80
Potassium oxide (K <sub>2</sub> O) .....	—	4.19	10.07	3.80	5.18
Boric oxide (B <sub>2</sub> O <sub>3</sub> ) .....	nil	3.01	9.60	1.66	2.62
H <sub>2</sub> SO <sub>4</sub> color reaction .....	brown	blue	red	brown	brown

Samples B, C, D, E deflagrated on ignition from presence of nitrates.

"VALENCIA" SAFFRON.

—	1.	2.
	Per cent.	Per cent.
Ash, total .....	4.95	5.00
Ash, insoluble in water .....	1.75	1.60
Ash, insoluble in HCl dil. ....	0.50	0.25
Alkalinity of ash .....	2.75 Cc.	2.80 Cc.
Loss on drying at 100° C. ....	10.86	12.40
Cold-water extract .....	51.50	50.30
Ash of extract .....	3.60	3.20
Nitrogen .....	1.90	1.85
Woody fiber .....	3.70	3.21
Potassium oxide (K <sub>2</sub> O) .....	2.37	2.39
Ether extract .....	1.52	1.68
Alcohol (61 per cent.) extract ..	56.76	55.92
H <sub>2</sub> SO <sub>4</sub> color reaction .....	blue.	blue.

Other observers have previously recorded figures, which in 8 examples cited by the author correspond well with the figures obtained with "Valencia" saffron.—Pharm. Journ., Feb. 29, 1908, 267.

## ZINGIBERACEÆ.

*Ginger—Examination of the Powder.*—According to E. Reich the following data are necessary for the examination of powdered ginger: Volatile and non-volatile ether extract, alcoholic extract (according to

Winton), alcoholic extract after ether, petroleum-ether and methyl-alcohol extract, ash, sand and water soluble and insoluble (sand-free) ash. These data permit, it is claimed, the determination of the variety of genuine powdered ginger and of adulteration with spent ginger and with fixed oil, but no single one of them is sufficient for the purpose. African ginger is particularly rich in volatile ether extract, Bengal ginger in sand. If kept under unsuitable conditions loss of volatile oil and consequent deterioration rapidly take place. For details the original article should be consulted, in which a number of analyses are cited in full.—Pharm. Journ., Jan. 11, 1908, 31; from *Ztschr. f. Unters. d. Nahr. u. Genussm.* 14, 549.

*Ginger—Phenolic Characters of Pungent Principle.*—In a preliminary note, James Grier and H. Garnett state that little or no work has been done on the subject of the pungent principle of ginger since the very thorough work of Thresh, some twenty-five or thirty years ago (see *Proceedings*, 1880 and 1885, pp. 83 and 257). In a previous inquiry it was found that the pungent principle, "gingerol," had marked phenolic proportions. The authors now find that it is possible to isolate the total phenolic constituents, and to free them from all other bodies of a non-phenolic character, but they have not yet satisfied themselves that the phenols so isolated are chemically homogeneous, or that they are all physiologically active. The experiments, however, warrant the authors in concluding that the gingerol described by Thresh is not a simple body, and they are continuing their work on the subject. Incidentally, they describe a simple test by which pure ginger preparations may be distinguished from those fortified by capsicum. *Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy)* 1907, 441-446.

#### ARISTOLOCHACEÆ.

*Asarum Blumei, Duch.*—*Yield and Characters of Volatile Oil.*—According to Asahina, the Chinese drug "*To-ko*" is the dried entire plant (with roots and rhizome) of *Asarum blumei*, Duch. It contains 1.4 per cent. of volatile oil of a yellowish color, and a sassafras-like odor; sp. gr., 1.0788 at 15° C.; opt. rot., + 5° 3'; acid no., 0; sapon. no., 0. It contains eugenol, safrol, and a terpene-like body. The drug met with in commerce under the name *Sai-sin* or *Si-sin*, whose mother-plant is said to be *Asarum sieboldi*, originates, according to the author, also from *Asarum blumei*, Duch., and is consequently identical with "*To-ko*."—Schimmel's Rep., Oct., 1907, 15; from *Journ. Pharm. Soc. of Japan*, 1907, 362.

#### OLACACEÆ.

*Muira-puama—Renewed Attention to its Aphrodisiac Value.*—G. Weigel recalls that among the drugs that are modernly exploited for the treatment of impotence, with yohimbe bark in the lead, the Brazilian drug, "*muira-*

puama," has long been employed in its native home as an aphrodisiac remedy. He is in error, however, when he states that it has become known in the literature only during the last few years, for it was described by Kleesattel in 1892 (see Proceedings, 1893, 278 and 855) as consisting of the wood and root of a plant which he identified as *Liriosma ovata*, Miers, while Rebougeon believed the drug to be derived from *Acanthaea virilis*. It was described also by Peckolt (1901), who made a proximate examination of the drug, while Cæsar and Loretz gave a formula for a fluidextract in 1899 (see Proceedings, 1900, 475). Modernly the drug is exploited in form of a specialty under the name of "muriacithin," for example (which see in Proceedings, 1905, 544, and 1907, 734), a combination of the fluidextract of the drug with ovolecthin. Dr. Weigel gives a pharmacognostic description of the drug, and reviews its proximate constituents as revealed by the investigations of Peckolt and of Rebougeon. —Pharm. Centralh., xlix (1908), No. 8, 139-141.

*Muira-Puama*.—*Botanical Classification*.—Tunman directs attention to the erroneous assignment of *Liriosma ovata*, Miers, from which "muira-puama" is supposed to be derived, to the N. O. Oleaceæ, whereas it properly belongs to the Olacaceæ, a family not at all related to the Oleaceæ, but near to the Santalaceæ and the Loranthaceæ. The Olacaceæ are tropical trees which are characterized by spirally-formed leaves, with entire margins, and usually small flowers, with a 4 to 6-toothed calyx and 2 to 5 foliated ovary. They are distinguished from the Santalaceæ by the structure of the calyx, and by the ovary from the Loranthaceæ. John Miers, whose name qualifies the species, was variously engaged in the study of the Olacaceæ, and has, for example, by his researches established the inclusion of a number of genera originally assigned to the Santalaceæ (*Myoschilos*, *Arjona* and *Quinchamalium*) in the N. O. Olacaceæ.—Pharm. Ztg., liii (1908), No. 28, 279.

#### THYMELEACEÆ.

*Lasiosophones*.—*South African Species*.—G. E. Oliver calls attention to two South African species of *Lasiosophon*, *L. meisneri* and *L. anthylloides*. These plants, which occur as shrubs or shrublets are known in the Kaffir vernacular as "isi-Dikili," are esteemed by the native for their tonic and blood-purifying properties and in the treatment of certain kinds of sore throat, and one or two species are used as antidotes to snake poison. Sims mentions that there are about twelve ill-defined species recognized. The different species vary in size, the smallest standing only a few inches from the ground, the largest growing to a height of 6 or 7 ft. The flowers are yellow, of varying shades, according to the species, and appear in heads surrounded by involucre bracts. The leaves are small, narrow and more or less lanceolate in shape. The activity of the plant resides chiefly in the root-bark, and its action, whatever may be its virtue, is prolonged.

About fifteen or twenty minutes after chewing a fragment (especially of *Lasiosophon meisneri*) a tingling sensation on the tongue and tonsils is experienced, which increases in intensity until one has the sensation of having eaten a particularly hot curry. This effect does not entirely disappear until after about twenty-four hours. A chemical examination of the root-bark shows it to contain a very small quantity of volatile oil, tannin (to which its virtue in sore throat would perhaps be attributable), and a resin, and it is apparently to this resin that its scorching properties are due, as it produces the sensation above referred to on the tongue, though it does not yield it to acidulated water when boiled with the latter. It contains no alkaloid.—Chem. & Drugg., April 25, 1908, 645.

## LAURACEÆ.

*Camphor—Cultivation Experiments in France and Algeria.*—The question of the cultivation of camphor trees in France and Algeria is discussed by Professor Tabouriech, steps having been taken in this direction both officially and privately. The problem to solve was as to whether the camphor trees in their new surroundings would be able to preserve their power of secretion, and whether the production of camphor would give an efficiency so as to allow of being commercially worked. At first the question appeared to be answered in the negative, as the tests of the wood and leaves of camphor trees cultivated in the Jardin d'Essai at Algiers and at other Algerian stations did not permit of the extraction of the least trace of camphor. Since 1895, however, Professor Trabut, director of the botanical service of the government of Algeria, has maintained contrary opinions. He declares that he extracted from leaves of young camphor trees, which he himself had sown, a very appreciable quantity of camphor, the amount being exactly 38 Gm. from 6.6 lbs. of leafed twigs. Notwithstanding this result the plantation was discontinued. Prof. Tabouriech states that he himself has had occasion to examine leaves of the only camphor tree at the Jardin des Plantes at Montpellier, which is fifteen years old, is very vigorous, and shoots forth long branches every year. The investigations made by the author were with fresh leaves from branches cut last March. The leaves were submitted to distillation and yielded 0.65 per cent. of camphor. While this yield is less than that obtained by Trabut, and more recently by Betandier (1.05 and 1.40 per cent.), it is not surprising, as the tree is cultivated in a conservatory and has not plenty of light and air, and its power of secretion has consequently diminished.—Pharm. Journ., Nov. 23, 1908, 693; from Bull. de Pharm.

In a subsequent paper, Professor Tabouriech attributes the unsuccessful attempts to obtain camphor in the preliminary investigations of Trabut to the employment of a camphorless variety, *Camphora inuncta*, Hardy.—Schimmel's Rep., April, 1908, 23; from Bull. des Scienc. Pharm. 14 (1907) 259.

Schimmel & Co., in a review of the preceding, quote from a compilation of Cayla on the same subject that Trabut has obtained from trees grown by grafting twigs of the genuine camphor tree on *Camphora inuncta*, the "camphorless species," the same good yield as from the tree with genuine roots. The fluctuation observed in the yields are not due to climatic influences, but are explained by differences in the individual species, and possibly also in the individual trees. In further illustration, Cayla discusses especially the researches of Crévost and of Lan with regard to the occurrence of several camphor-producing varieties in Tonquin. Cayla concludes that, after what has become known up to the present, the prospects of the camphor cultivation in Tonquin are not unfavorable.—*Ibid.*, from Journ. d' Agric. trop. 8 (1907), 335.

*Camphor—Production in Formosa.*—R. I. Geare, quoting U. S. Consul J. H. Arnold, stationed at Tamsui, Formosa, gives an interesting account of the production of camphor in Formosa, which must be consulted in the original. The paper is illustrated by a cut showing a camphor-distilling station Biolitsu.—*Drugg. Circ.*, Feb., 1908, 55-56.

*Cinnamon Barks—Ash-Content of Commercial Sorts and Quality.*—Loock contributes an interesting article on commercial cinnamon barks, in which he points out the fallacy of the customary valuation of the powdered bark according to the ash content. Thus, for example, very good Ceylon cinnamon is found in commerce, which contains as high as 8 to 9.8 per cent. of ash, and may contain over 8 per cent. even after carefully freeing it from adhering dust and sand. With regard to the commercial sorts, the author observes that the inferior bark of *Cinnamomum Cassia* retains its popularity as a spice in Germany, whereas in Italy, Spain and South America the bark of *Cinnamomum ceylonicum* has always been given the preference. The ground cinnamon ("kaneel" of German commerce) is understood to be a German product obtained by grinding the ordinary cassia cinnamon with more or less of the more aromatic and lighter-colored fragments (so-called chips) of the better barks, to improve its quality. These "chips" being derived from the barks furnishing the quill-cinnamon, during the process of sorting, rolling, insertion, smoothing and trimming, have essentially the same composition and ash-content as the barks from which they are derived, and by their admixture with the common or wild cassia bark may thus produce powders which respond to the microscopic requirements and ash content, while a powder produced under normal conditions from prime "chips," may be rejected on account of a high ash content. The author enumerates nine successive grades of cinnamon barks in the order of their quality under the following designations: (1) honey-sweet cinnamon; (2) creeping (snake-) cinnamon; (3) camphor cinnamon; (4) astringent cinnamon; (5) mucilaginous cinnamon; (6) flat cinnamon; (7) wild cinnamon; (8) blossom-cinnamon; (9) clover-cinnamon.

These cinnamons again vary according to conditions of soil, cultivation, care in collection and preparation for the market.—Pharm. Ztg., liii (1908), No. 30, 300; from Ztschr. f. Offentl. Chem., 1908, No. 5.

*Tetranthera Polyantha*, var. *Citrata*.—*Examination of Volatile Oil from Different Organs*.—E. Charabot and G. Laloue have examined separately the volatile oils derived from various parts of *Tetranthera polyantha*, var. *citrata*. The fruits of this plant, which have been substituted for cubebs, were formerly described as being derived from *Daphnidum cubeba*, but were subsequently traced by E. M. Holmes and A. de Wevre to *Litsea* (*Tetranthera*) *citrata*. The oil distilled from the bark has the specific gravity 0.8673 at 15° C.;  $a_D + 20^\circ 30'$ ; acetyl value, 85.5; it contains 8 per cent. of citral, 20 per cent. of citronellal, and 56.5 per cent. of an alcohol, probably geraniol, with 2.4 per cent. of esters. The oil from the leaves, specific gravity, 0.9013, at 15° C.;  $a_D - 12^\circ 30'$ ; acetyl value, 104.7; contained 6 per cent. of citral, 21.2 per cent. of cineol, and 31.3 per cent. alcohol, probably geraniol. The oil from the fruits, with the specific gravity, 0.8872;  $a_D + 12^\circ 44'$ ; acetyl value, 172.5; gave 64 per cent. of citral, 19.4 per cent. of an alcohol, probably geraniol, and 2 per cent. of esters.—Pharm. Journ., Mar. 14, 1908, 351; from Compt. rend., 146 (1908), 349.

## MYRISTICACEÆ.

*Mace*—*Color Test for the Distinction of Bombay from the Banda Drug*.—Paul Stoepel finds that the inferior powdered Bombay mace (from *Myristica malabarica*) may be distinguished from the official Banda mace (from *Myristica fragrans*) by the following color reaction: 0.5 Gm. of the powder is digested with 5 Cc. of absolute alcohol with frequent shaking for 15 minutes. A slip of filter-paper is saturated with the filtrate, dried, boiling baryta water poured on it, and again dried. Banda mace in this way communicates a light, yellow-brownish color, while Bombay mace gives a brick-red color.—Apoth. Ztg., xxiii (1908), No. 4, 34.

## POLYGONACEÆ.

*Polygonum Cuspidatum*—*Emodin an Abundant Constituent of the Rhizome*.—The value of *Polygonum dumentorum*, a common weed throughout Germany, as an efficient purgative has recently been pointed out by Tunmann (see Proceedings, 1907, 765, the entire herb being used in the form of decoction. Goris and Crété now direct attention to the aperient value of the rhizome of *Polygonum cuspidatum*, a species which is often cultivated in France as an ornamental plant, and is characterized by uncommonly large rhizomes. These contain emodin in abundance in the bark, and also throughout the entire root-tissues during the early stages of their development. The authors found in the dried bark of the matured rhizomes, 1.2 per cent. of emodin, in the dried pith, 1.4 per cent., and in the entire rhizome (dried), 0.67 per cent. of emodin. They recom-

## PLANTAGINACEÆ.

*Plantago Species*—*Aucubin (Glucoside) a Constituent*.—Several years ago Bourquelot and Hérissé isolated and described a new glucoside, aucubin ( $C_{13}H_{18}O_8 + H_2O$ ), which they obtained by the biochemical method of Bourquelot from *Aucuba japonica*. L. L. Bourdier, having observed that an infusion of the leaves of *Plantago major* when subjected to the action of emulsin assumed a nearly black color after several-hours' exposure, which the before-named authors had mentioned as being characteristic of the presence of aucubin, applied the biochemical method of Bourquelot to the extraction and examination of this and other species of *Plantago*, and has succeeded in isolating a glucoside in a pure, crystallized condition, which proved to be identical with the aucubin of *Aucuba japonica*, L., from three of the species, namely, *Plantago major*, *P. media*, and *P. lanceolata*; whilst three other species—*Plantago arenaria*, *P. cynops*, and *P. psyllium*, probably also contain the same glucoside. Furthermore, the author has succeeded in demonstrating the presence of *invertin* and of *emulsin* in all of the *Plantago* species examined, these ferments being observed in all of the organs—in leaves, roots, flowers and seeds.—Arch. d. Pharm. 246 (1908), No. 2, 81–88.

## SCROPHULARIACEÆ.

*Digitalis*—*Relative Toxicity of First and Second Years' Leaves*.—E. J. Hart prepared tinctures of digitalis leaves: *A*, from carefully dried leaves of first year's growth; *B*, from carefully dried leaves of the second year's flowering plant; *C*, from second year's leaves, badly dried (at excessive temperature); and *D*, from carefully dried leaves of the second year's growth, from which the petiole and greater part of midrib were previously removed. With these several tinctures he determined the minimum lethal dose of each per 100 Gm. body weight on frogs, with the following results:

<i>A</i> . First year's leaves, carefully dried.....	10.0 minims.
<i>B</i> . Second year's leaves, carefully dried.....	12.5 minims.
<i>C</i> . Second year's leaves, badly dried.....	16.6 minims.
<i>D</i> . Second year's leaves, carefully dried, deprived of petiole and midrib .....	13.6 minims.

These experiments led to the inference that digitalis leaves of first year's growth are more toxic than leaves of the second year's flowering plant, and that careful drying is necessary; but the more remarkable result shown is that, apparently, the lamina of the leaves are less toxic than the entire leaf.—Pharm. Journ., April 4, 1908, 440.

*Digitalis*—*Physiological Examination*.—Dr. C. Focke has recently proposed a monograph on digitalis for inclusion in the G. P., in which he limits the physiological examination of the leaves to the months of July, August and September, because, as stated in his earlier communications



on the subject (see Proceedings, 1905, 629), he had found that during this period of the year there is less variation in the cardiac action of frogs than during other periods, this activity being more pronounced during the warm season than during the colder months, while, on the other hand, it was important that the experiment should be made on recently caught frogs and in a cool atmosphere. Much depends on the weight of the frogs, which should be of medium size and weight. Experiments since made (which are described in detail) have shown that these inconvenient restrictions are superfluous, and point out, what is of primary importance, that the physiological examination may, under certain precautions, be conducted at all seasons of the year. He has found that the reactionary activity of frogs, depending on the season—greater during the cool months and more sluggish during the heated term—may be neutralized by preserving the frogs in appropriately warmed or cooled localities, and therefore modifies his monograph by eliminating the passage confining the physiological examination to the summer months and by substituting the following passage: "The temperature of the experimental room must be adjusted to the reactionary ability of the frogs, depending on the season in which the examination is made." Furthermore, it is provided that the frogs to be used for the experiment shall be of medium size (20–35 Gm. in weight).—Arch. d. Pharm., 245 (1907), No. 9, 646–656.

*Digitalis—Standardisation of its Preparation by Both Physiological and Chemical Means.*—In a joint paper of Dr. E. D. Reed and Chas. E. Vanderkleed on "the standardization of preparations of digitalis by physiological and chemical means," Dr. Reed records physiological experiments, made with various preparations of digitalis and with the active principle digitoxin which point out very clearly, to his satisfaction, that digitoxin represents, if not all, by far the most important properties of digitalis. How closely the lethal dose of these preparations is related to digitoxin present in them, he considers to be convincingly proven by the chemical results obtained by Mr. Vanderkleed, and he avers that the idea is rapidly gaining ground among clinicians that digitoxin is the real active principle of digitalis, from which all the effects of digitalis preparations can be obtained. Its use in a pure condition probably is a long way off, and we must still depend for the most part on a reliable tincture or fluidextract for digitalis therapy; but as there are several other principles in digitalis other than digitoxin, which are not inert, but evidently reinforce digitoxin in its action, and as these principles are not easily determined by chemical assay, it seems advisable that digitalis should be standardized, as to digitoxin content, which assures us of its therapeutic effect and, furthermore, the toxic action of the combined principles should be determined by means of physiological tests. Mr. Vanderkleed's investigation, which are recorded in some detail, serve to support this view. It would seem from the published table of results obtained with tinctures,

fluidextract, and powdered extract, that quite a uniform relationship exists between the percentage of digitoxin found and the amount of the digitalis preparation required to kill a standard-weight guinea-pig in a definite time.—*Amer. Journ. Pharm.*, March, 1908, 110-120.

*Digitalis—Does Digitoxin Represent the Therapeutic Value of the Drug?*—Dr. Horatio C. Wood, in view of the fact that "digitoxin" (the crystalline digitalin of Nativelle), after having been practically abandoned outside of France, has recently come to the fore (largely on account of vigorous advertising by certain drug manufacturers) as representing the therapeutic properties of digitalis leaves in a compact and pure form, critically reviews the clinical observations that have been made with this substance since its discovery (1871), to the present day, which make it extremely doubtful that digitoxin represents digitalis either quantitatively or qualitatively. While in a general way the effects of digitoxin upon the circulation are similar to those of digitalis, there are certain differences which may seem slight, but yet which are of great practical importance. Indeed Kalkowski, in a series of studies upon the isolated heart of both frog and the mammal, reached the conclusion that none of the principles thus far found in digitalis had the same effect upon the heart muscle as did the tincture or infusion of digitalis. The principles he studied included digitoxin, digitalein and digitalinum.—*Amer. Journ. Pharm.*, Mar., 1908, 107-110.

*Digitalis—Comparison of Tinctures Prepared from Fresh and from Dried Leaves.*—Astrue and Déjean's experiments demonstrate that tincture of digitalis (1 : 5) prepared from dried leaves contains a much larger relative proportion of digitoxin than does the tincture of fresh leaves, known in France as "Alcoolature de Digitale," prepared with the same weight of 90 per cent. alcohol. The latter contained only about one-tenth as much digitoxin as that found in the tincture of the dried drug and, therefore, allowing a difference of 80 per cent. between the fresh and dried leaves for water content, the latter still contained twice as much of the active constituent as the corresponding quantity of fresh leaves. The authors attribute this difference to the influence of ferments, etc., which have partially destroyed the glucoside before extracting the fresh leaves with alcohol.—*Pharm. Ztg.*, liii (1908), No. 28, 278; from *Journ. de Pharm. et Chim.*, xxvii (1908), No. 6.

*Linaria Vulgaris—Glucosidal Constituents.*—In a previous paper (see Proceedings, 1907, 770), T. Klobb and A. Fandre described a very stable glucoside, linarin, which they obtained from the flowers of *Linaria vulgaris*. It is accompanied by another amorphous glucoside,

*Pectolinarin*, which has also been described by Schlagdenhauffen and Reeb as a gelatinous body resembling pectin. In continuation of the previous researches, Klobb now finds that the two glucosides are closely related,

pectolinarin differing from linarin only in containing one mol.  $H_2O$  more, when boiled for a long while in water it becomes dehydrated and converted into crystalline linarin. Both glucosides when hydrolized gave a reducing sugar not yet identified, and a mixture of two crystalline phenols, linaric phenol and anhydrolinaric phenol, which also differ from each other by one molecule of water. Under the influence of alkalis, pectolinarin is changed into  $\beta$ -pectolinarin, which, when hydrolyzed, gives only linaric phenol. Linarin, similarly treated with alkali, is changed into  $\beta$ -linarin; this, when hydrolyzed, gives only anhydrolinaric phenol. Pectolinarin is much more soluble than linarin, and is isolated from the mixed glucosides by extraction with alcohol, 50 per cent. It is an amorphous straw-yellow mass, melting-point,  $188^\circ$ – $190^\circ C$ . It is almost insoluble in cold water, but dissolves on boiling, and is also soluble in hot alcohol. Its solutions gelatinize on cooling. Like linarin it is very soluble in strong hydrochloric acid and in caustic potash solution. Linaric phenol,  $C_{19}H_{14}O_7$ , is best obtained by hydrolysis of  $\beta$ -pectolinarin. It is purified first by crystallization from acetone, then from glacial acetic acid. These crystals give up their acetic acid at  $100^\circ$ – $110^\circ C$ , leaving the pure body in fine lemon-yellow crystals, melting-point  $245^\circ C$ . The solution of these in caustic soda gives a characteristic green precipitate on exposure to the air. Anhydrolinaric phenol,  $C_{19}H_{12}O_6$ , is obtained as above indicated by hydrolyzing  $\beta$ -linarin. It forms straw-yellow needles, melting-point,  $267^\circ$ – $268^\circ C$ . Its solution in caustic soda does not form a green precipitate on exposure to the air. The actual formula of the linarin molecule is not yet established, but results obtained point to  $C_{30}H_{50}O_{28}$ ; if the sugar formed by hydrolysis should prove to be a hexose the decomposition of  $\alpha$ -linarin into the phenols, and this sugar might be expressed by the equation:  $C_{30}H_{50}O_{28} = C_{19}H_{14}O_7 + C_{19}H_{12}O_6 + 2(C_6H_{12}O_6)$ . —Pharm. Journ., Aug. 31, 1907, 316; from Compt. rend., 145 (1907), 331.

## SOLANACEÆ.

*Solanum Dulcamara*—Proximate Constituents of the Fruits.—A. A. Wells and Grant S. Reeder have made a proximate chemical examination of the fruits of *Solanum dulcamara*, collected at Sylvan Beach, New York, in which they determined besides an abundance of sugar (fructose), both tartaric and citric acid, together with atropine—the latter being identified by characteristic tests. The seeds contained a considerable quantity of fixed oil, evidently consisting of olein and palmitin.—Chem. News, Oct. 25, 1907, 199–200.

*Belladonna Leaves*—Substitution by Poke Leaves.—O. A. Farwell calls attention to a recent importation into this country of a parcel of leaves purporting to be belladonna leaves, which gave no trace of alkaloid. A careful examination proved them to be poke leaves, *Phytolacca decandra*, L., a plant native of America. This plant has become naturalized through-

out Southern Europe ; but while belladonna roots have been known to be substituted by poke roots, the substitution of leaves by poke leaves has heretofore not been noticed by the author.—*Drugg. Circ.*, July. 1907, 459.

*Belladonna—Assay of Cultivated Leaves and Root.*—John R. Rippetoe reports satisfactory experimental results in cultivating belladonna in the Shenandoah Valley of Virginia. First year's leaves, collected in October, assayed 0.32 per cent. of mydriatic alkaloids. Leaves collected from the same plants when plowing, in the following July, assayed 0.68 per cent. of alkaloids ; and an average plant, collected October 1st, produced 7 ounces of dry leaves, assaying 0.48 per cent., and 5 ounces of dry root, assaying 0.38 per cent. of alkaloids. While the root is below the U. S. P. requirement, it is up to the average of the drug on the market.—*Amer. Journ. Pharm.*, Nov., 1907, 523-524.

*False Belladonna Leaves—Report on Microscopic Examination.*—M. H. Stiles having received from Mr. Holmes a sample of leaves offered on the London market for belladonna, with a request that he examine them microscopically, so as to find a ready means of distinguishing them from the leaves of *Atropa Belladonna*, submits a preliminary report in which he describes the leading diagnostic characters of the two leaves (true and false) as revealed by his work. The leading features are arranged in tabular form, for ready comparison, and descriptive notes of photomicrographs showing the chief points are appended, although the present paper does not show these in illustrations. While not a very lengthy paper, it cannot be conveniently condensed and must be consulted in the original. (It may here be mentioned that this work of Mr. Stiles is of particular interest in connection with the recent observation of Warin that the low percentages of alkaloid noted by German authors in belladonna extracts (which see under "Pharmacy") are possibly due to an admixture of *Scopola carniolica* leaves in Austrian belladonna leaves, which are largely found on the German market—*Rep.*—*Pharm. Journ.*, Feb. 15, 1908, 189.

*Austrian Belladonna Leaves—Scopola Atropoides the Adulterant.*—J. Warin has more recently stated that the adulterant of Austrian belladonna leaves consists of the leaves of *Scopola atropoides*, and not of *S. carniolica* as originally stated.—*Ibid.*, May 23, 1908, 696 ; from *Journ. de Pharm. et Chim.* (6), 27 (1908), 399.

*Scopola versus Belladonna* is the subject of a paper by A. R. L. Dohme in the "Proceedings" of this Association, 1907, 502-504.

*Scopola Japonica—Characters and Uses.*—The "Chemist and Druggist" observes that although several tons of the rhizomes of *Scopola japonica* have recently been sold at the London drug-auction, there is practically no sale for this belladonna substitute on the London market, but in the United States it and the root of *S. carniolica* are used in the

manufacture of belladonna plasters. The Japanese rhizome is from 2 to 6 in. long, of varying diameter, commonly about half an inch thick. The portions, which are cylindrical, or compressed and knotty or bent, with circular disc-like scars, and frequently longitudinally wrinkled, are of a dark brown color externally, with grayish-white short fracture. The freshly broken pieces possess a slightly mousy, narcotic odor, which is quickly lost. The taste is slightly bitter. The histological characteristics are very similar to that of belladonna root, the chief difference being that the bark is less thick, the vascular bundles neither so large or numerous, the bundles of raphides less pronounced, and the starch grains smaller with less distinct shape. *S. japonica* and *S. carniolica* (habitat, Bavaria, Austro-Hungary, and southwestern Russia) are so closely allied that it is doubtful whether there is any specific distinction.—Chem. & Drugg., June 20, 1908, 937.

*A Spurious Henbane.*—*Occurrence in the American Market.*—Dr. A. B. Lyons calls attention to a variety of "Hyoscyamus" that has recently appeared in the American market, which is described as "coming from a new source of supply," and remarkable for its large content of alkaloid. It consists largely of stems which are mostly without epidermis, very light in weight, and nearly white in color. The few leaves present are very much broken—in fact almost in a coarse powder. Enough of the capsules are present to show that the plant, while doubtless a *Hyoscyamus*, is not *Hyoscyamus niger*, L. The drug yields to assay 0.8 per cent. of a readily crystallizable alkaloid, evidently hyoscyamine. There can be little doubt that the plant is *Hyoscyamus muticus*, L., which, when grown in Egypt, contains about that proportion of alkaloid.—Amer. Drugg., Dec. 23, 1907, 390.

*Hyoscyamus Muticus*—*Substitution for Hyoscyamus Niger and Atropa Belladonna.*—William Mansfield calls attention to the importation at the present time of *Hyoscyamus muticus* (whole plant) as a substitute for *Hyoscyamus niger* and *Atropa Belladonna*, and that in view of its high alkaloid content (*hyoscyamine*) its use as a substitute for the official drug would prove dangerous. He describes the microscopic elements of the two species of *Hyoscyamus*, illustrated by drawings accompanying his paper, which show the tissue characters of the two drugs to be radically different, and sums up the diagnostic characters of *Hyoscyamus muticus* as follows: (1) Yellow sinuous-walled testa cells. (2) Compound multicellular branched hairs. (3) Irregular, thick-beaded, walled sclereids. (4) Short sclereids with thick, striated walls. (5) Irregular, thin-beaded, walled sclerenchyma cells. (6) Pitted tracheal tissue with bordered pores.—Drugg. Circ., June, 1908, 255-256.

*Hyoscyamus Muticus*—*High Percentage of Alkaloidal Content.*—Edwin Douzard observes that recently a large quantity of henbane appeared on

the American market, which contained an extremely high percentage of alkaloid: the whole drug, 0.75 per cent., the root, 0.83 per cent., the stem, 0.48 per cent., the leaf, 1.34 per cent., and the seed, 1.17 per cent. As the Egyptian variety of henbane, *Hyoscyamus muticus*, is the only species known to contain alkaloid in such proportions, it was surmised that the drug consisted of this species and this was proven to be the case. In order to ascertain if the active principle consisted of one or more mydriatics, the author prepared a quantity of alkaloid by a process which he described, obtaining about 26 Gm. of a slightly colored crystalline alkaloid, corresponding to 0.65 per cent. of the drug employed. By a process of fractionation he obtained from this 18 fractions of aurichlorides of the base, which were identified as hyoscyamine aurochloride by their melting-points, which ranged from 157.5° C. to 162° C. The purified alkaloid was also prepared and examined, and this had the melting-point of 107° C., and a laevorotation of -20.4° C. Pure hyoscyamine has the m. p. 108° C., and the specific rotation -21° C.; pure atropine has the m. p. 111° C., and is optically inactive, while pure hyoscyne is liquid at ordinary temperatures. Similarly, atropine aurichloride melts at 136° C. to 138° C., hyoscyamine aurichloride at 159° C. to 162° C., and hyoscyne aurichloride melts at 197° C. to 199° C. The author's experiments thus confirm the results of Dunstan and Brown, who proved in 1899 (see Proceedings, 1901, 676) that *Hyoscyamus muticus* contained hyoscyamine as the sole alkaloidal constituent. This Egyptian drug is evidently equal if not superior to the official henbane, and since it can be obtained in large quantities, the author thinks the question of its use in medicine should be taken up.—Amer. Journ. Pharm., May, 1908, 201-204.

*Nicotiana Glauca*, Graham—*Poisoning of Hogs by Wild Plants*.—The poisoning of a considerable number of hogs in Mexico, which had been fed on a plant common in the neighborhood but unknown to be poisonous led the owner of the hogs to send a well-fruited plant for identification. It proved to be *Nicotiana glauca*, Graham. O. A. Farwell in this connection mentions that several similar occurrences were called to his attention some years ago. According to Coulter, this plant is the "Coneton" or "Tronadora" of the Mexicans, and is naturalized in southern Texas, where it is frequently cultivated. Judging from the very strong "tobacco" odor emanating from the specimen submitted, Mr. Farwell has no doubt that it could be developed by cultivation into a very good tobacco plant.—Drugg. Circ., July, 1907, 459.

*Tomatoes—Constituents*.—According to the analysis of J. M. Albaharg, fresh tomatoes contain 93.5 per cent. of moisture, 0.95 per cent. of albuminoids, 0.20 per cent. of fat, 3-6 per cent. of carbohydrates, 1.69 per cent. of insoluble organic matter, 0.11 per cent. of insoluble inorganic matter, 0.74 per cent. of ash, of which 0.12 per cent. was calcium phos-

phate, 0.48 per cent. of malic acid, 0.09 per cent. of citric acid, 0.001 per cent. of oxalic acid, with traces of tartaric and succinic acids; these acids, however, are not all those present. Another organic acid, probably glycolic acid occurs.—Pharm. Journ., Sept. 14, 1907, 361; from Compt. rend. 145 (1907) 131.

*Nierembergia Hippomanica*—*Poisonous Alkaloid a Constituent*.—In 1875 Echegaray found in *Nierembergia hippomanica*, a solanaceous plant indigenous to Argentina and known in the vernacular as "chus-chu," a glucoside, hippomanin, to which the poisonous effect of this plant on cattle was attributed. Recent investigation, however, by P. Laveuir and J. Sanchez, in the official laboratory of the Department of Agriculture at Buenos Ayres, has failed to substantiate the presence of this glucoside, but a very poisonous alkaloid, *nierembergine*, has been isolated, as well as two resins and a coloring principle. *Nierembergine* was isolated as the sulphate in the form of a soft pasty mass, very soluble in water, and affording the usual alkaloidal reactions. The free base, liberated from the tannate, has the same physical characters as the sulphate. It causes frothing with aqueous solutions on agitation, like saponin. It differs from all the hitherto known solanaceous alkaloids. When given by hypodermic injection to frogs and guinea pigs it is extremely toxic. The plant is still under investigation.—Pharm. Journ., Oct. 5, 1907, 435; from Jour. de Pharm. et Chim., 26 (1907), 220.

#### VERBENACEÆ.

*Lippia Scaberrima*, Sonder—*Proximate Constituents*.—Frederick B. Power and Frank Tutin report the results of a chemical investigation of the proximate constituents of a South African medicinal plant, locally known by the name of "Beukess Boss" (meaning Beukess' bush or shrub), which has been identified by Mr. E. M. Holmes as *Lippia scaberrima*, Sonder. The material was composed of the air-dried leaves and stems of the plant, and had an agreeable aromatic odor, reminding of lavender and sage. Besides about 0.25 per cent. of an aromatic volatile oil (which see under "Organic Chemistry"), heptacosan ( $C_{27}H_{56}$ ), hentricontan ( $C_{31}H_{64}$ ), a small quantity of a paraffin (m. p.  $80^{\circ}$  C.), a phytosterol ( $C_{27}H_{46}O$ —m. p.  $134^{\circ}$  C.), some unsaturated alcohols, free formic and butyric acids, the esters of these acids and of valerianic, arachic, and linoleic acids, etc., the following more interesting constituents were obtained and are described:

1. *Lippianol*,  $C_{25}H_{46}O$ , a new, colorless, crystalline substance, which has all the properties of a monohydric alcohol, but is present only in the amount of about 0.05 per cent.
2. *Two yellow crystalline substances*, present in extremely small quantities, which both melt at  $267^{\circ}$  C., and a trace of a third crystalline substance having the melting-point  $123^{\circ}$  C.

3. *A glucoside-like body*, yielding besides glucose only indefinite hydrolytic products, was also indicated, but could not be isolated. Glucon (principally the inactive form) was also found as a constituent, together with resins and other amorphous products.—Arch. d. Pharm., 245, (1907), No. 5, 337-350.

#### LABIATÆ.

*Collinsonia Canadensis*—*Constituents*.—Chevalier and Abal have isolated from this drug a glucosidal saponin and a resin, but were unable to obtain Lohmann's alkaloid. The saponin was found to be a weak cardiac tonic, in large doses an irritant. Both stimulate gastro-intestinal glandular secretion, and produce an abundant diuresis.—Pharm. Journ., Jan. 18, 1908, 57; from Bull. des Sci. Pharm., 14 (1907), 513.

*Cyprus Origanum*—*A Perennial Plant*.—The uncertainty existing as to the exact botanical source of the oil of origanum manufactured in Cyprus, which has recently been the subject of examination and report at the Imperial Institute (see Proceedings, 1907, 883), has induced E. M. Holmes to apply to the Director of Agriculture at Cyprus for a specimen of the plant in flower. By means of this and of specimens sent to him for identification by Professor W. R. Dunstan, the Director of the Imperial Institute, Mr. Holmes has now been able to determine that the plant yielding the oil in Cyprus is one which has been lost sight of for a long time, having been clearly described by Willdenow in the "Species Plantarum" (vol. 3, 137). The ordinary garden marjoram, *Origanum majorana*, L., is, in England, always an annual plant, but the plant from Cyprus has a perennial stem, and agrees exactly with Willdenow's description of

*Origanum majoranoides*, which in Morison's work ("Pl. Hist." vol. 3, p. 359) is named *Majorana hortensis odorata perennis*. It was evidently, therefore, known as a garden plant over two hundred years ago. The present paper is illustrated with an excellent photograph representing the plant. Speaking of the oil of the Cyprus marjoram, Mr. Holmes observes that the outlet for it is not for use in culinary art, but as an ingredient of perfumes used in soap manufacture, and that it is no doubt important as a source of carvacrol, since the percentage (82.5 per cent.) is higher than that of most other species of origanum. Moreover, that it must not be confounded with the so-called oil of origanum of commerce, which, as pointed out in "Pharmacographia" (2, p. 487) is distilled from *Thymus vulgaris*, L., and contains thymol in place of its isomeride carvacrol.—Pharm. Journ., Sept. 21, 1907, 378.

*Orthosiphonis Stamineus*—*Description and Medicinal Use of the Leaves*.—O. Tunmann calls attention to the leaves of *Orthosiphonis stamineus* (the so-called "Java-tea") which is now frequently recommended and used in form of infusion and extract for the treatment of gout, bladder and kidney affections, has recently been admitted into the Dutch Pharmac-



pœia. The drug is described as resembling common peppermint, the leaves varying in size according to age, up to 7.3 Cm. in width. They are ovate-lanceolate, with acuminate point, wedge-shaped base, and are symmetrically serrated; the petiole only 4-8 Mm. in length. The quadrangular stem, admixed with the leaves, exhibits a bluish coloration and the typical structure of the labiates, and the drug also contains some isolated bluish-white racemic flowers, which are usually not fully opened, showing the plant was gathered before the full flowering period. The presence of the flowers affords excellent evidence for the recognition of the drug in the microscopic diagnosis of the powder, the pollen grains in particular, which resemble the spores of lycopodium, but are readily recognized after clearing up the field with alcoholic chloralhydrate solution. The microscopic features are shown in cuts illustrating the original text.—Pharm. Centralh., xlix. (1908), No. 12, 219-224.

*Patchouli*.—*Botanical Sources of Commercial Sorts*.—A recent article in the "Kew Bulletin" (1908, p. 78), in which the author points out that the patchouli plant used in China is not the patchouli of European commerce (*Pogostemon Patchouli*, var. *suavis*, Hook. f.), but is a plant formerly described under the name of *Plectranthus Patchouly*, Clark, occurring in Kasia and Assam, which was subsequently figured and described in the "Kew Bulletin" (1902, p. 10-11), under the name of *Microtania cymosa*, Prain, leads Mr. E. M. Holmes to mention that this was already proven in a paper published by him in 1896 (see Proceedings, 1896, 563-565). Furthermore, the author of the recent article quoted suggests that the *Pogostemon Patchouli* of Pelletier, which was first described by Blanco (1837) as *Mentha cablin*, and by Benthham renamed *Pogostemon cablin*, should in future be called *Pogostemon cablin*, Benth. In the opinion of Holmes, this would be a great mistake from a practical standpoint, and also from a botanical aspect. "Patchouli" is a commercial name, which no botanical authority can alter in Europe into "cablin." From a botanical point of view according to priority of name in the proper genus, this species stands thus: *Pogostemon Patchouli*, Pelletier, 1845; *P. cablin*, Benthham, 1848; *P. Patchouli*, var. *suavis*, Hook. f., 1885; *Mentha cablin*, Blanco, 1837. By right of priority the appropriate and familiar name "patchouli" should be retained. From a review of the available information concerning the botanical sources of the different sorts of patchouli, these may reasonably be concluded to be as follows:

Patchouli of European commerce, *Pogostemon Patchouli*, Pellet.

Patchouli or "Patcha" of Bombay, *Pogostemon Heyneanus*, Benth.

Patchouli or "Dilem" of Java, *Pogostemon comosus*, Miq.

Non-flowering Java Patchouli, *Pogostemon Patchouli*, Pell.

Patchouli of N. India and Assam, *Microtania cymosa*, Prain.

—Pharm. Journ., Mar. 14, 1908, 348.

## CONVOLVULACEÆ.

*Ipomoea Purpurea*—*Chemical Examination*.—Frederick B. Power and Harold Rogerson have made a very comprehensive examination of material consisting chiefly of the aerial stems of the common "Morning Glory" (*Ipomoea purpurea*, Roth., syn. *Ipomoea congesta*, R. Br.; *Convolvulus purpureus*, L.; *Tharbitis hispida*, Choisy), collected for examination in South Africa under the supervision of Mr. Wood, director of the Natal Botanical Gardens, Durban. The interest pertaining to this subject depends upon the fact that the stems and roots of the plant, called by the natives of South Africa "i-Jalapa," are used by them as an aperient medicine, and are believed to be as valuable for this purpose as true jalap. The drug as received had the following characters: Curved, rope-like pieces a meter or more in length, and varying in diameter from 8 Mm. in larger pieces to 1 Mm. or less in the branches. Color, light brown; fracture, short, except in the bark, where fine, long, silky fibers project; odor and taste slight. When extracted with alcohol, and the resulting extract distilled with steam, an amount of *volatile oil* was obtained corresponding to 0.018 per cent. of the weight of the drug. This oil was a pale yellow liquid, having a strong characteristic odor and the following constants:  $d_{20}^{20} / 20^{\circ} = 0.9085$ ;  $n_D^{20} - 4^{\circ} 52'$  in 1 Dcm. tube. The residue in the distillation flask consisted of a dark-colored liquid and a quantity of soft resin. The aqueous liquid contained a considerable quantity of *potassium chloride* and *nitrate*, together with *tannic acid* and *coloring matters*, and yielded *glucose* on heating with a dilute mineral acid. The crude *resin* corresponded in amount to 4.8 per cent. of the weight of the drug, and was soluble to the extent of 15.5 per cent. of its weight in ether. When dry the crude resin may be reduced to a dark brown powder, and in this crude condition it is optically inactive; but after treatment with animal charcoal, to deprive it of coloring matter, it was found to have a specific rotatory power, in alcoholic solution, of  $[\alpha]_D - 50.95^{\circ}$ . The resin, however, proves to be an exceedingly complex mixture, as was shown by the results of its successive extraction in the crude condition with the following solvents, these extractions in turn being likewise of complex composition:

*Light Petroleum* extracted 8 per cent. of the total resin, yielding after treatment with alcoholic KOH, *pentatriacontane* ( $C_{35}H_{72}$ ), *phytosterol* ( $C_{27}H_{46}O, H_2O$ ), formic, butyric, and higher volatile acids; stearic, and apparently some palmitic acid, with a very small amount of an unsaturated oily acid.

*Ether* then extracted 7.3 per cent., yielding when fused with KOH, formic and butyric acids, a mixture of higher volatile acids, and a very small amount of a crystalline acid, apparently *aseleic acid* ( $C_8H_{16}O_4$ ), together with a trace of substance giving the catechol reaction. Next,

*Chloroform* extracted 9.8 per cent. of the total resin, yielding when

fused with KOH products analogous with those obtained under the same conditions with ether, but no crystalline acid. Then,

*Ethyl Acetate* extracted 23.8 per cent. of the total resin. From this extract a very small amount of a new crystalline alcohol, designated as

"*Ipuranol*," was isolated, having the formula  $C_{23}H_{38}O_2(OH)_2$ , and melting at  $285^{\circ}$ – $290^{\circ}$  C. Its *acetyl derivative* formed pearly leaflets, melting sharply at  $160^{\circ}$  C. The extract, when fused with KOH, yielded products analogous with those obtained from the ether and chloroform extracts of the resin by the same treatment. The

*Alcohol Extract*, however, represented the largest proportion of the crude resin, namely about 50 per cent. When purified by means of animal charcoal, it was obtained in the form of a perfectly white powder, which, after drying at  $110^{\circ}$  C., melted somewhat indefinitely between  $150^{\circ}$  and  $160^{\circ}$  C. Its specific rotatory power was  $[\alpha]_D -51.64^{\circ}$  C. When heated with 5 per cent. alcoholic  $H_2SO_4$ , this extract, like the preceding ones, yielded a small amount of neutral oil, formic, butyric, and higher volatile acids, and a non-volatile acid which was readily soluble in water, together with glucose. In addition to these products, however, it afforded a quantity of a new "dihydroxymonocarboxylicacid," designated by the authors

*Ipurolic Acid*,  $C_{15}H_{26}(OH)_2CO_2H$ . This crystallizes in fine, colorless, silky needles, melting at  $100^{\circ}$ – $101^{\circ}$  C. Several derivatives of this new acid—the *sodium* and *silver salts*, the *methyl ester*, and the *monomethyl derivative* and *diphenyl-methane of the methyl ester*, have been prepared and studied.

*The physiological action* of the several extracts of the original crude resin have been determined by Dr. H. H. Dale, Director of the Wellcome Physiological Research Laboratories. From this it appears that the "petroleum-extract" has no definite effect, that the "ether-," "ethyl acetate-" and "alcohol-extracts" have a very marked purgative action, without noticeable difference between them, and that the "chloroform-extract," with a rather less pronounced aperient action, caused slight vomiting when administered in the same dose (one gramme), as were the others, to a dog, at intervals of several days.—*Amer. Journ. Pharm.*, June, 1908, 251–286.

"*Mexican Scammony*"—*Identification as Orizaba Jalap*.—William Duncan calls attention to a parcel of "Mexican Scammony," received by him with the information that it was regularly imported and sold, presumably for the manufacture of scammony resin. He identified this drug to be Mexican woody, or Orizaba jalap, described in "Pharmacographia," and there stated to be the probable source of the jalapin of English pharmacy. The observation is particularly noteworthy, because the drug now appearing under the misleading title of "Mexican scammony" is,

according to the B. P. Codex, the principal source of the scammony resin of commerce. The drug examined by Mr. Duncan was a mixture of roots and stems, the former predominating.—Pharm. Journ., Mar. 21, 1908, 378.

#### BIGNONIACEÆ.

*Amphicome Emodi*—*A New Indian Drug*.—David Hooper calls attention to a new Indian drug, consisting of the roots and stems of *Amphicome Emodi*, a handsome perennial plant growing in the western Himalayas, from Kashmir to Nepal, at elevations of 2000 to 9000 feet. It is about 1 foot high, and the flowers, which are about 2 inches long, stand erect when expanded. The leaves are alternate, unequally pinnate, and the leaflets are toothed. The flowers are bright pink, tubular, and arranged in axillary or terminal racemes. The fruits are about the length and thickness of a crow-quill, and the seeds are provided with a tuft of hairs or a lacinate hyaline wing at each end. The drug, which is collected by the villagers and sold in the village of Kotli (Kashmir) under the name of "Kaur," consists of the root-stocks with the attached roots and stems, in pieces of 5 or 6 inches in length, with smaller broken portions. The crown of the root is about an inch across, but the roots and stems are of the thickness of a crow-quill. The root bark is soft and corky, pale brown in color, with longitudinal and transverse cracks. The stems are similar in color, exhibiting the scars of fallen leaves. The interior of the bark is dark chestnut-brown, and contains the active principles. The powdered drug had no peculiar odor, but a strong, bitter and acrid taste. A chemical examination of the powdered drug revealed the presence of the following principles: (1) A bitter, colorless alkaloid, more soluble in chloroform than in ether, dissolving in sulphuric acid with a brown color, changing to purplish-red. (2) Tannin, giving a greenish color with ferric chloride, and precipitated with gelatin solution. (3) A yellow fat, with acid properties. (4) A wax, soluble in petroleum-ether. (5) An orange coloring matter, turning brown with alkalis. (6) A brown resin, turning green with the vapor of nitric acid. (7) Abundance of sugar, reducing Fehling's solution. There was no crystalline principle similar to oroxylin detected.—Pharm. Journ., Oct. 19, 1907, 506.

#### GENTIANACEÆ.

*Gentian—Adulterated Powder*.—G. W. Marvin calls attention to powdered gentian imported from the continent which contained an abnormal proportion of woody matter. In one case the admixture had the appearance of quassia (probably exhausted). The source of the impurity in the second case is uncertain. It consisted, to a great extent, of fibrous wood cells crossed by medullary rays three or four cells wide. Fortunately, the color of the adulterated drug is paler than that of English-ground samples, and naturally the taste and aroma are correspondingly weaker. A very

cursory microscopical examination is sufficient to detect the admixture.—  
Chem. & Drugg., June 13, 1908, 901.

## APOCYNACEÆ.

*Acocanthera Venenata* and *A. Spectabilis*.—*South African Arrow-poison Plants*.—G. E. Oliver describes *Acocanthera venenata*, G. Don, and *A. spectabilis*, regarded a coastal variety of the same plant, in a short paper, accompanied by illustrations exhibiting the peculiar shape and venation of the leaves of *A. spectabilis*, and branches of *A. venenata* in flower and in fruit. He says that *A. venenata* is one of the most interesting of South African medicinal plants, and was formerly the source of the Bushman's or Hottentot's arrow-poison. Its Kaffir name, *Ubuhlungu benyoka*, denotes that it is considered by them an antidote for snake-bite, though it is by no means one of the most important for this purpose. It belongs to the natural order *Apocynaceæ*, and the young twigs, on being broken, yield the milky juice characteristic of this order. It should be sought among dense bush, and is not to be found away from shade. In its natural situations it attains a considerable height (10 to 12 ft.), and may be known by its laurel-like leaves, each of which is furnished with a rigid prickle at the apex. The typical leaf is broadly lanceolate or oval, but they may be variously shaped (especially in the variety *spectabilis*). The prickle at the apex, however, is present in every case, as shown in the illustration mentioned. The shrub is seen at its best in the spring (September and October), when it bears clusters of jessamine-scented whitish flowers with a pinkish tint, and some of the berries of the previous season are still adhering. These berries are of the shape, size and color of a large purple-grape, and contain two flattish oval seeds. The shrub is intensely poisonous, and an overdose produces violent vomiting. Andrew Smith, to whom the author acknowledges obligations, mentions in his "South African Materia Medica," that Sir T. R. Fraser has isolated a glucoside, *acocantherin* from the plant, and that the presence of an alkaloid seems to be indicated. Chem. & Drugg., Jan. 4, 1908, 20.

*Gelsemium*.—L. E. Sayre contributes a paper on the assay of preparations of gelsemium, in the "Proceedings" of this Association, 1907, 356–359.

*Strophanthus*.—*Variety Most Suitable for Admission into the Pharmacopœias*.—In view of the uncertainty concerning the relative medicinal value of the different commercial sorts of strophanthus seeds, Arthur Meyer has undertaken a critical review and study of the literature on the subject, which leads him to the conclusion that it would be disadvantageous to admit either the "*hispidus*" or "*gratus*" strophanthus seeds in place of the "*kombe*" strophanthus into the Pharmacopœia, but that it is necessary to so direct our endeavor as to secure a more satisfactory supply of the "*kombe*" seeds. To this end he recommends: (1) To encourage an

early beginning of the cultivation of *Strophanthus kombe*, Oliver, in German East-Africa; (2) that the peeled fruits, stamped with the name of the plantation, be placed on the market, or, perhaps, for the foreign market, the seeds in properly closed and stamped bags; and (3) that the examination of the seeds imported from the German plantations be made at an official station, and that seeds possessing certain activity shall be supplied to the market under the control of such official station. In case it be considered desirable to secure the "*hispidus*" drug uniformly in absolutely genuine and pure condition, the conditions of collection or cultivation, and the examination, should, in like manner, be under official control.—Arch. d. Pharm., 245 (1907), No. 5, 252-259.

*Strychnos Aculeata*.—*Chemical Examination*.—A. Hébert says that the fruits of *Strychnos aculeata*, or of a closely allied species, are employed by the natives of the Ivory Coast as a fish poison. They are large spherical nuts from 8 to 10 Cm. in diameter, with thick shells enclosing a spherical seed 5 or 6 Cm. in diameter when dried. The entire fruit weighs 100 to 150 Gm., and the seed 30 to 40 Gm. The fruit contains no strychnine, and only a trace of brucine; this occurs mostly in the kernel, where it amounts to 0.05 per cent. The fruit is, however, an active fish poison, since 1 part macerated in 10,000 parts of water will kill fish. The toxic substance is probably a glucoside. It does not affect frogs or mammals.—Pharm. Journ., Mar. 28, 1908, 413; from Journ. de Pharm. et Chim., 27 (1908), 151.

#### STYRACEÆ.

*Benzoin*.—*An Exceptional Sample*.—Discussing the U. S. P. requirements for benzoin, L. Henry Bernegau calls attention to a specimen of refined benzoin of an extraordinarily strong vanilla-like odor, and, suspecting a cheap resin flavored with vanillin, this was subjected to careful examination. It proved to be almost completely soluble in 5 parts of warm alcohol, soluble in KOH solution, nearly free from cinnamic acid, but yielding 11.74 per cent. of benzoic acid by sublimation, and leaving only 0.58 per cent. of ash on incineration. The specimen was, therefore, evidently not an adulteration, but a high-grade quality, probably refined Siam benzoin with a small percentage of Sumatra benzoin.—Amer. Journ. Pharm., Dec., 1907, 553.

*Benzoin*.—*Insoluble Matter in Commercial Samples*.—Albert R. Thornevell has determined the amount of matter insoluble in 90 per cent. alcohol in six commercial samples of benzoin, described as follows:

Sample 1. Invoiced "Siam Elect;" it was in clean separate tears.

Sample 2. Invoiced "Siam;" it was in block, almonds few. The greater part of the block was a pale amber-colored resin with a reddish tinge. Aroma slight. This sample was bought direct from a French source.

Samples 3, 4, 5 and 6. Invoiced "No. 2 Benzoin Almondy."

These samples were all Sumatra benzoin in block. The results of the determination were as follows :

	Per cent.
Sample 1. Siam, matter insoluble in 90 per cent. alcohol	= 0.865
Sample 2. Siam, matter insoluble in 90 per cent. alcohol	= 5.87
Sample 3. Sumatra, matter insoluble in 90 per cent. alcohol	= 17.28
Sample 4. Sumatra, matter insoluble in 90 per cent. alcohol	= 16.95
Sample 5. Sumatra, matter insoluble in 90 per cent. alcohol	= 18.35
Sample 6. Sumatra, matter insoluble in 90 per cent. alcohol	= 13.35

The author also determined the free and combined acid in one of the samples of Siam benzoin, and the free acid in the other. The total acid was determined by saponifying with semi-normal alcoholic potash in the cold, allowing twenty-four hours with occasional shaking for reaction to complete itself. The difference between the total and free acid, calculated as benzoic acid, gives the combined acid. The results are shown in the following :

	Free acid.	Combined acid.
Sample 1. Siam.....	3.53 per cent.	33.53 per cent.
Sample 2. Siam.....	12.07 per cent.	Not determined.

—Chem. & Drugg., Nov. 30, 1907, 824.

*Styrax Obassia*, Siebold et Zuccarini—*Constituents of the Fruit*.—Y. Asahina has isolated from the peels of the fruit of *Styrax obassia*, Siebold et Tuccarini a crystalline, non-glucosidal body, for which he proposes the name

*Styracit*.—It forms snow-white prisms, having a sweetish taste at first, then bitterish ; the crystals melt at 165° C., are tolerably hygroscopic and easily soluble in water, forming a neutral solution. It is difficultly soluble in cold alcohol, and nearly insoluble in ether, benzene and acetone ; dissolved in cold conc. sulphuric acid without coloration, but the solution is browned on heating. It does not reduce Fehling's solution after heating with mineral acids, nor give any of the usual reactions for glucosides. Its composition corresponds to the formula  $C_{28}H_{40}O_8$ , and is consequently isomeric with  $\beta$ -methylglucoside, which has the same melting-point ; but its identity with this is excluded by its non-glucosidal characters. The seed yielded to ether 18.2 per cent. of fixed oil, showing the following constants : Sp. gr. at 15° C., 0.974 ; acid number, 9.00 ; saponification number, 180.00 ; Hübl iodine number, 127.00 ; Hehner number, 91.00. The fruit-peel of the only other Japanese *Styraceæ* (*Styrax Japonica*, Siebold et Zuccarini) was examined sometime ago by S. Keimatzu, who isolated a saponin (styrasaponin) of the composition  $C_{38}H_{60}O_{18}$ , which was found to be poisonous to fish—the peel of the fruit of this species being used as a fish poison in Japan.—Arch. d. Pharm., 245 (1907), No. 5, 325-328.

## ERICACEÆ.

*Chimaphila Umbellata*—*Efficiency in Diabetes*.—According to Soules the leaves of *Chimaphila umbellata* have been used with excellent results in the treatment of diabetes. The author employed it in the form of a fluidextract prepared with 50 per cent. alcohol in daily doses of 8 Grm. continued for some time.—Pharm. Ztg., liii (1908), No. 19, 192; from Journ. de Pharm. d'Anv., 1908, No. 8.

## COMPOSITÆ.

*Achillea Millefolium*, L.—*Characters of Volatile Oils from Whole Plant and from Flowers*.—Arthur Sievers distilled the volatile oils from fairly fresh milfoil plants (*Achillea Millefolium*, L.), a little later from the entire dried plant, and also from the flowers by themselves, during the summer of 1904, and now reports on their physical and chemical characters and constants. These several oils are characterized by a deep blue color, which had not changed appreciably at the time of writing, almost two years later. The yield of oil from the dried herb was 0.237 per cent., and not as large, relatively as from the fresh herb, which lost 57 per cent. on drying. The constants of the two oils are shown in the following:

	Milfoil Oil.	
	From fresh herb.	From dried herb.
Specific gravity, shortly after distillation.....	0.8687	0.8873
Specific gravity, retaken in 1905. ....	0.8760 at 18° C.	0.8935 at 18° C.
Saponification number.....	37.7	29.3
Corresponding to ester, calculated as bornyl acetate, 13.2 per cent.		10 per cent.
Or calculated as alcohol.....	10.27 per cent.	8 per cent.
Saponification number, after acetylation, average..	74	66.4
Corresponding to alcohol, calculated as C <sub>10</sub> H <sub>17</sub> OH, 20.35 per cent.		19.25 per cent.
Therefore percentage of free alcohol.....	10.08 per cent.	11.25 per cent.

The small amount of oil at the author's disposal was insufficient to investigate the bearer of the beautiful blue color of the oil; but a single experiment in that direction, made by fractionating a portion of the oil of the entire plant, after saponification, showed the second fraction to retain an intensely blue color on standing, while the third fraction became water-white within a short time, and all the other fractions up to the eighth lost their blue color in succession, though remaining yellowish. The acids from the saponification appeared to be mainly, if not entirely, acetic acid. The author appends an interesting table, which will be found useful for a comparison of the oils thus far obtained from five species of *Achillea* and from different parts of the same species.—Pharm. Rev., July, 1907, 215-218.

*Atractylis Gummifera*—*Poisonous Glucosidal Constituent of the Root*.—*Atractylis gummifera* is one of the few recorded instances of a plant of the N. O. Compositæ containing a poisonous principle. The fruit and receptacle are eaten without ill effects, but several fatal cases of poisoning



with the root are met with in medical literature. F. Angelice finds that the toxic principle is a white crystalline glucosidal acid,

*Atractylic Acid*, of complex structure, which occurs as a potassium salt,  $K_2C_{20}H_{32}S_2O_{18}$ . It is hydrolysed by heating with acids and alkalis, whereby sulphuric and valerianic acids, a pentose sugar, and an oily body, which solidifies on cooling, are formed. When the compound is heated with strong sulphuric acid the color produced passes slowly from red to violet. The violet solution, on standing in the cold, slowly deposits crystals of the same color. These give colorless solutions with alkalis, which are again colored violet on acidifying. The original compound, potassium atractylate, is non-toxic for frogs, but is fatal to rabbits in doses of 25 Cgm. per kilo body weight, and for dogs in the same dose given by the mouth. It produces tetanic convulsions like strychnine.—Pharm. Journ., Mar. 14, 1908, 351; from Arch. Farmacolog., 1907 (2), through Nouv. Remèdes, 24 (1908), 59.

*Anti-Opium Remedy from Chungking—Botanical Source.*—Mr. E. M. Holmes has recently received a packet of extract made from a plant used at Chungking as an antidote to opium, together with a drawing by a Chinese artist of the plant from which it is derived, and a description in Chinese of its method of use, which interestingly supplements the information concerning the "anti-opium plant," previously described by him (see Proceedings, 1907, 803). The illustration of the plant, which is reproduced in the present paper, is so naturally drawn that there is little difficulty in guessing that it belongs to the natural order Compositæ, and to the genus *Blumea* or a genus nearly allied to it. Mr. Holmes finds that the only Chinese species in the Kew Herbarium that seems to come near to the plant illustrated is

*Blumea Laciniata*, D. C., from Yunna; but Mr. W. Thurlow Lay, to whom the Museum is indebted for the present information, stated that the plant grew in his garden at Chungking, and in due course specimens of the plant may probably be secured for identification. This is the more important because in the Chinese note accompanying the illustration it is stated "the plant Chung-hsing is a useful antidote to opium, but there are many other plants which resemble it in appearance, and if any one has not a sufficient knowledge of botany to distinguish the right plant and uses the wrong one instead, the use of the latter will not, of course, be attended with any success." "The right plant alone has the property that when its juice is mixed with opium it will lessen the strength of the latter, and when taken internally will act as an antidote against the craving for opium."—Pharm. Journ., Sept. 14, 1907, 358.

*Blumea Balsamifera*, D. C.—*Culture Experiments in Tonquin.*—According to Cayla, *Blumea balsamifera*, D. C., which grows in Tonkin in large batches, is now receiving attention from the agricultural authorities

with the object of extracting the borneol (Ngai camphor) from its oil on an economic scale. Lan has found by personal observation that the plant grows preferably on deserted rice-fields overgrown with brushwood. The seed comes up quickly, and the bush grows rapidly, namely about 10 feet in 3 years. The natives pick the leaves twice every year, these yielding about 0.25 per cent. of the borneol or Ngai camphor. Haller of Paris, to whom samples of this substance were sent for approval, expressed a favorable opinion in his report to the Tonkin Board of Agriculture and believes that the *l*-camphor which can be produced from the oil by oxidation, and which may possibly be used for the same purpose as the Japanese *d*-camphor can compete with the latter if it is possible to supply the Ngai camphor at a proportionately low price.—Schimmel's Rep., April, 1908, 150; from Journ. d' Agric. tropicale 8 (1908), 30.

*Burdock—Cultivation.*—J. Long, in response to frequent inquiries, describes the following method of cultivating burdock for medicinal use: In preparing the soil for growing burdock the ground should be plowed deep and as early in the spring as possible; after the ground is broken and harrowed it should be thrown up in ridges about three feet apart, all clods being knocked from the top of the ridges. The seeds are then drilled in the ridges and covered about an inch deep. When the plants come up they should be kept clear of weeds and grass, and cultivated with a plow, as corn is cultivated. The deeper the ground is made mellow, the larger the roots will be, as they go down to hard pan. The harvest is just before the ground freezes in the fall. In digging the roots a plow should be run along one side of each row two or three times, so as to make as deep a trench as possible; the digger then uses a spade to get down to the bottom of the roots, which are often seen two feet long and as large around as a man's arm. After the roots are dug they should be cleansed of all dirt and leaves, cut in thin slices lengthwise, and spread on floors to dry, or they may be dried by moderate artificial heat, never allowing the temperature to go so high as to scorch the roots. Mr. Jones has known a yield of 2,200 pounds from a single acre.—Pharm. Era, Feb. 13, 1908, 201.

*Grindelia.*—A contribution by F. B. Power and Frank Tutin on the chemical examination of *Grindelia*, supplementary to a paper of the previous year, appears in the "Proceedings," 1907, 337-344.

*Grindelia—Substitution by Misonella Minima, D. C.*—O. A. Farwell calls attention to a small California plant received as "grindelia," which upon examination proved to be one of the plants known in California as "tarweeds," and was identified as *Misonella minima*, D. C. The plant was only 2 or 3 in. high, and the inflorescence was very glutinous, giving it a faint resemblance to a very diminutive form of grindelia.—Drugg. Circ., July, 1907, 460.

*Helianthus-Tubers—Value as a Food-Crop.*—Dr. J. Koch has investigated the value of the tubers of *Helianthus decapetatus* and *H. doronicoides* which have in recent years been recommended in France as a new winter-vegetable. His observations lead him to the conclusion that these tubers are superior in their nutrient qualities to potatoes or turnips and deserve attention as a regular winter food-crop. Moreover, the tubers may be utilized for the manufacture of inulin and levulose, and his experiments have demonstrated that they may serve well for the production of alcohol.—Apoth. Ztg., xxiii (1908), No. 44, 391.

Referring to Dr. Koch's observations, Ludwig Kroeber confirms the value of helianthus tubers as an economic food crop. The plants require little or no attention, reproducing themselves from year to year after they have been once planted, and the tubers, which have an artichoke-like taste, may be used for all the purposes for which potatoes are now used—serving well also as cattle food, to which purpose they lend themselves on economical grounds. The author, however, directs attention to the diuretic effect following the use of the tubers as a vegetable.—Ibid., xxiii (1908), No. 48, 430.

*Insect Powder—Active Constituent.*—S. Sato has isolated a light yellow, transparent, odorless, syrupy resin from *Pyrethrum* flowers, which he regards as the active constituent of insect powder and has named it

*Pyretol.* This is at first tasteless, but subsequently has a benumbing effect upon the tongue. It is insoluble in water and in diluted acids, but soluble in all proportions in alcohol, ether and petroleum-ether. It is soluble also in hot alkaline solutions, but when precipitated from such solutions by acids, the resin becomes completely inactive.—Pharm. Ztg., lii (1907), No. 66, 689; from Journ. of Pharm. Soc. of Japan, 1907, No. 304.

*Insect Powder—Method of Valuation.*—C. M. W. Grieb recommends the following method for the valuation of insect powder which is based on the percentage of matter soluble in ether (oleo-resin): A preliminary trial is made with about 1 Gm. of the powder, which is shaken in a test-tube with 10 Cc. of ether; if, after settling, the ether is of a marked green color (indicating the presence of ground stalks), the assay is not proceeded with, and the sample is rejected. If the ether is not colored green, about 5 Gm. of the powder is weighed out into a tall narrow beaker; 50 Cc. of ether is added, and the whole stirred up with a glass rod. The powder is allowed to settle, then stirred up again. This is repeated twice, and the ethereal solution is decanted through a filter-paper into a tared platinum basin; the residue is washed by decantation with more ether, and finally washed onto the filter-paper, which is then thoroughly washed with ether. In all, not more than 150 Cc. of ether need be used. The ether is evaporated, and the basin heated on the water-bath for two minutes, and

then weighed on cooling. It may be interesting to note that the highest figures, in almost every case, were given by the oleo-resin which was of a golden-yellow color. Nine specimens examined, obtained at different times from the same source, gave figures ranging from 7.3 to 12.4 per cent.; five others, from 7.0 to 12 per cent. of oleo-resin.—Chem. & Drugg., May 30, 1908, 848.

*Sneezeweed—A Dangerous Plant to Stock.*—O. A. Farwell states that specimens of *Helenium autumnale*, L., commonly known as "sneezeweed" or "sneezewort," and other species of *Helenium*, are frequently submitted to him for identification and other information regarding them. The genus *Helenium* contains some twenty-two species; fifteen are chiefly southern, extending westward to the prairies, two of which reach as far north as Pennsylvania and Illinois; two are of the Rocky Mountain region, one extending west to the coast; three are of the Pacific coast region; and one, *Helenium autumnale*, extends over the entire country. When in flower it is considered dangerous to stock, and if eaten in large quantities generally proves fatal. When eaten by stock the pulse is accelerated, staggering occurs, breathing becomes difficult, and the animal becomes very sensitive to the touch. If eaten in fatal quantities death is preceded by convulsions.—Drugg. Circ., July, 1907, 459.

*"Punaria Ascochingæ"—Identification as Brachycladus Stuckerti.*—In response to an inquiry as to the botanical source of an asthma remedy said to be derived from a plant designated as "Punaria Ascochingæ," E. M. Holmes has instituted careful research in modern botanical works, in the Kew herbaria and at Berlin, which failed to show that any plant existed bearing that name. It developed, furthermore, that the name "puna" is a term applied in South America to asthmatic complaints, and it is conjectured that the name is one manufactured for trade purposes. Further, it developed that the plant is a species of *Brachycladus* (N. O. Compositæ), named *B. Stuckerti*, Mr. Stuckert having called attention to this plant as being employed with extraordinary success by the natives of Argentina for the mountain affections called locally "mal de puna" or "soracho."—Pharm. Journ., Mar. 7, 1908, 316.

#### VALERIANACEÆ.

*Valerian—Presence of Saccharose Confirmed.*—N. Kromer has examined a crystalline deposit which had formed in tinct. valerianæ æthereæ, and determined it to be saccharose. Following up this observation, he has examined a number of commercial sorts of valerian root and found saccharose in all of them, although varying considerably in quantity (from 0.30 to 1.42 pro mille). From Russian valerian he also obtained some glucose, which was identified by its characteristic osazone.—Pharm. Centralh., xlix (1908), No. 21, 397.

## RURIAEÆ.

*Cinchona Barks—Histology of Some Varieties.*—L. Rosenthaler observes that *Cinchona robusta* is believed by some botanists to be a hybrid between *C. succirubra* and *C. officinalis*, whereas, on the other hand, Hesse considers it to be a form of *C. succirubra*. Rosenthaler also finds that the structure of the bark is more closely allied to that of *C. succirubra* than that of *C. officinalis*, and from the anatomical point of view Hesse's opinion is probably correct. The bark of *C. Ledgeriana* grafted on *C. succirubra* retains the typical *Ledgeriana* character, and shows little or no influence from the stock.—Pharm. Journ., May 23, 1908, 696; from Ber. d. D. Pharm. Ges., 18 (1908), 126.

*Cinchona Seeds—Presence of Alkaloids and Order of their Development in the Young Plants.*—Experiments made in the Dutch governmental laboratories and reported by G. v. Leersum, director of the Cinchona Experimental Station, have resulted in some highly interesting observations concerning the ontogenesis of the cinchona alkaloids. After previous investigators had failed to determine the presence of alkaloids in cinchona seeds, v. Leersum had already in 1905 shown that *Cinchona Ledgeriana* seeds, after germinating 10, 20 and 30 days, *did* contain alkaloids, these consisting of amorphous alkaloid and cinchonine after the first two periods, while after 30 days' germination, cinchonidine was also present. Following up these observations, v. Leersum has now obtained results, which he summarizes as follows:

1. In contradiction to the findings of Moens, Dr. Lotsey, and C. B. van Dijk, the seeds contain not only the so-called amorphous bases, but also *crystalline cinchonine*.
2. Already at the beginning of germination, when the seeds begin to swell, a second crystalline alkaloid, *cinchonidine* makes its appearance, its quantity increasing rapidly when the seeds burst and the plantlets issue.
3. The genesis of the bases is in the following order: *amorphous alkaloid*; *cinchonine*; *cinchonidine*; *quinine* and *quinidine*.
4. The leaves of *C. Ledgeriana* plants, 13 months old, contain besides amorphous alkaloids, both cinchonine and cinchonidine.
5. The quality of alkaloid is different in the roots of young *C. Ledgeriana* plants, and larger, than in the stems of the same plantlet. In the roots, the quinine and quinidine are developed before they are formed in the stems.—Pharm. Centralh., xlix (1908), No. 12, 232-234; from Ber. omtrent de Gouvernements Kina-onderneming, 4e Kwartaal, 1907.

*Coffee—Acid Constituents.*—The investigations of the constituents of coffee by K. Gorter demonstrate that the chlorogenic acid, described originally by Pagen, occurs in these seeds in combination with potassium and coffeine. He has obtained this acid in form of perfectly white crystals, of the m. p.  $206^{\circ}$ – $207^{\circ}$  C., having the composition  $C_{32}H_{38}O_{16}$ , and that it is not a glucosidal body, as has been assumed by some authors, but is

simply split up by alkalies into coffeic acid and quinic acid. Moreover, he has determined the presence of a new acid in coffee, which he names

*Coffalic Acid.* It forms white prisms, melting at  $255^{\circ}$  C., and together with chlorogenic acid and other as yet undetermined bodies, probably forms the so-called coffee-tannic acid, which is not a symmetric body.—Pharm. Ztg., liii (1908), No. 21, 213; from Liebig's Annal., 1908, No. 3.

*Caffeine-less Coffee—Process of Manufacture.*—K. Wimmer, at a recent convention of the Independent Union of Public Analysts of Germany, after speaking of the difficulties encountered in devising a process for the extraction of the caffeine from the whole, green coffee seeds, so that they shall retain their appearance, taste and aroma unimpaired when washed, describes the method by which this was finally accomplished. The most difficult problem was the unlocking of the cells so as to render them accessible to the action of solvents suitable for the removal of their caffeine-content. This necessitates a preliminary treatment of the raw coffee, the nature of which is, however, not described. The coffee is then extracted with ether, benzol or chloroform, which removes all but traces of the caffeine, while all other constituents, such as coffee-tannic acid, sugar, etc., which during the roasting process cause the puffing-up of the seeds, and develop the taste and aroma, remain intact in the coffee. The caffeine-less coffee, which is now manufactured on an industrial scale outlined by the author, retains at most 0.1 to 0.2 per cent. of caffeine, and of this not more than 70 per cent. is contained in the beverage as ordinarily prepared.—Schw. Wschr. f. Chem. u. Pharm., xlvii (1908), No. 7, 93; from Zschr. f. Effentl. Chem., 1907, No. 22, 436-440.

*Johore Ipecacuanha—Botanical Source.*—For some years past ipecacuanha root has been cultivated in the Malay States and imported into England under the name of Johore ipecacuanha, but the exact form of the plant under cultivation and the particular district in which it is cultivated are not stated in the text-books. Some of the Johore root first imported was examined by Mr. F. Ransom (see also the results of Umney and Swinton, Proceedings, 1900, 606) and reported to be practically as rich in alkaloid as that received from Brazil. As the attempts to grow ipecacuanha in India and elsewhere on a commercial scale failed, it became a point of some interest to determine the particular form or variety of the plant that succeeded so well in the Straits Settlements, and, after continued inquiries during the last few years, E. M. Holmes has at last succeeded in obtaining dried specimens of the plant under cultivation near Klang, in the Protectorate of Selangor, south of Perak, and on the West Coast of the Malay Peninsula. In comparing the following specimens of this "Selangor" plant with the description given in 1871 by Professor Balfour of two varieties of the ipecacuanha plant, cultivated in the Royal Botanical Gardens at Edinburgh, certain variations are noted by Mr. Holmes which

indicate the probability of there being three forms of the plant, viz., first, a plant with a shrubby stem, somewhat coriaceous leaves and short style, which, having originally been sent to Sir Joseph Hooker by Mr. Mackoy, of Liège, is designated by Mr. Holmes as "Mackoy's" plant; second, a plant sent by Dr. Gunning from Rio Janeiro, which may be termed "Gunning's" plant, with acute thinner leaves and herbaceous stem; and third, the Johore ("Selangor") plant, which has oblong, lanceolate, slightly scabrous leaves, with stamens and style of equal length. The only difficulty to be solved is whether the stamens or style become prolonged after the flower opens, as happens in colchicum; but in any case the "Selangor" plant appears to be a distinct form or race, and as such worthy the attention of cultivators. In concluding his interesting paper, which should be consulted in the original, Mr. Holmes calls attention to a recent statement by Mr. F. Ransom that the percentage of alkaloid in "Selangor" ipecacuanha is now less than when the drug was first imported.—Pharm. Journ., Jan. 18, 1908, 54.

*"Ipecac"*—*An Alkaloid-free South American Variety*.—O. A. Farwell has examined a sample of "ipecac" from South America, from that section which produces ipecac, and which is used by the natives in preference to the genuine variety. The roots are rather soft, of varying length, from one to three inches, and of about the thickness of Carthagena ipecac. Some of the roots are tortuous, as in undulated ipecac, and some rather straight, with scattered, deep constrictions, as in striated ipecac. The bark is dark brown and striated; the fracture varies from bluish-gray to a dark purple; the wood is light yellow and porous. The powder is bluish-gray, and is smooth and oily to the touch. It has a peculiar burnt-wood odor and taste, reminding one of creosote. An assay of the drug for alkaloids, according to the process given in the United States Pharmacopœia, eighth revision, gave negative results.—Drugg. Circ., July, 1907, 459.

*Ipecac*—*Precaution in Estimations of Emetine*.—B. Peroni recommends the following method for extracting emetine from ipecac root: 0.5 Gm. of the powdered drug is made into a paste with about one-half its weight of water and lime, then dried, powdered and repeatedly extracted with chloroform. The chloroformic solutions are shaken out with water acidulated with acetic acid, and the acetic solution is decolorized by the addition of neutral lead acetate, removing the excess of lead by means of hydrogen sulphide. The emetine is then determined in the decolorized solution in the usual manner. If the attempt is made to obtain the emetine by the direct evaporation of the chloroformic solution, being a strong base it is liable to partially decompose the chloroform, and by the production of formic acid to be reduced with formation of a brown color.—Pharm. Ztg., lii (1907), No. 54, 565; from Boll. Chim. Farm., 1907, 273.

*Morinda Citrifolia*, L.—*Chemistry of the Root-bark*.—The comprehen-

sive chemical investigation of the root-bark of *Morinda citrifolia*, L., by O. A. Oesterle and Ed. Tirza, has determined the following constituents :

*Morindin*,  $C_{27}H_{30}O_{15}$  ; light yellow needles, m. p.  $245^{\circ}$  C., hydrolysed into *morindon* and a non-fermentable sugar. (The acetate melts at  $236^{\circ}$  C. ; the benzoate at  $186^{\circ}$  C.)

*Trioxymethyl-anthraquinone-monomethyl ether*,  $C_{16}H_{12}O_5$  ; lemon-yellow needles, m. p.  $172^{\circ}$  C. ; soluble in alkalies and in sulphuric acid with an orange-red color ; *not* identical with the trioxymethylanthraquinonemonomethylether obtained by the authors from the wood *Morinda citrifolia*. (The acetate melts at  $148^{\circ}$  C.)

*Morindadiol*,  $C_{15}H_{10}O_4$  (Dioxymethylanthraquinone) ; yellow needles, m. p.  $244^{\circ}$  C. ; soluble in alkalies with orange-red color, in sulphuric acid cherry-red. (Acetate melts at  $229^{\circ}$  C.)

*Soranjidiol*,  $C_{15}H_{10}O_4$  (Dioxymethylanthraquinone) ; red-brown needles, m. p.  $276^{\circ}$  C. ; soluble in alkalies with a blue-violet color, in sulphuric acid cherry-red, changing to violet after some time. (Acetate melts at  $230^{\circ}$  C.)

*Substance*,  $C_{16}H_{10}O_5$  ; yellow needles, m. p.  $210^{\circ}$  C. ; soluble in alkalies and sulphuric acid with orange-red color.

*Wax*,  $C_{18}H_{38}O$  ; white needles, m. p.  $124.5^{\circ}$  C.

Some of these substances are also contained in the root-bark of *Morinda umbellata*, which, in place of "morindadiol" and "soranjidiol," contains three substances of different composition and melting-point. Morindin is regarded the characteristic constituent of these two species of *morinda*, but is apparently not a constituent of all *morinda* species.—Arch. d. Pharm., 246 (1908), Nos. 2 and 3, 150-165.

*Yohimbi Bark—Chemical Tests.*—G. Weigel contributes an interesting monograph on the true yohimbi bark, derived from *Corynanthe yohimbi*, a rubiaceous tree native to the Cameroons, in which he describes certain chemical tests, whereby it may be distinguished from false yohimbi barks. It has been shown by Siedler and others to contain at least four alkaloids—*yohimbine*, sparingly soluble in ether, more soluble in absolute alcohol, readily dissolved by chloroform ; *yohimbenine*, readily soluble in ether, absolute alcohol and chloroform, the latter solution showing a green fluorescence ; melting-point,  $105^{\circ}$  to  $106^{\circ}$  C. ; more soluble in 50 per cent. alcohol than yohimbine ; a *third base*, sparingly soluble in ether, readily dissolved by absolute alcohol and by chloroform ; a *fourth alkaloid*, insoluble in ether, and sparingly dissolved by the other two solvents. Yohimbi bark contains from 0.3 to 1.5 per cent. of total alkaloids, of which yohimbine alone is the active aphrodisiac. A false yohimbi bark containing chiefly yohimbenine is derived from the nearly allied *C. macroceras*. Another substitution is derived from *Pausinystalia trillesii*. True yohimbi bark forms a bulky powder ; a few particles of this when



shaken with very dilute aqueous caustic soda give a wine-red color, which deepens on standing exposed to the air. If about 1 Gm. of the powdered bark be shaken up with 20 Cc. of 1 per cent. hydrochloric acid solution and filtered, the filtrate affords a voluminous precipitate with Mayer's reagent. If from 2 to 3 Gm. of the bark be macerated with 50 Cc. of ether, 5 Cc. of chloroform, and 2 Cc. of solution of ammonia, with agitation, for thirty minutes, and then filtered, the ether-chloroform filtrate shaken out with 1 per cent. hydrochloric acid, the acid aqueous extract separated, and after evaporating off the dissolved ether, made alkaline with ammonia, the bases should be thrown down as a bulky white powder. After collecting and washing this with water, and dissolving it in 1 Cc. of strong sulphuric acid, and adding a particle of potassium dichromate, it should give almost immediately on moving backwards and forwards a deep bluish-violet color reaction characteristic of yohimbine.—Pharm. Centralh., xlviii (1907), Nos. 47 and 48, 967 and 985.

## LORANTHACEÆ.

*Viscum Album*—*Alkaloidal Constituent*.—Leprince has isolated a volatile alkaloid from mistletoe by extracting the dried plant with alcohol acidulated with hydrochloric acid, neutralizing the extract and subjecting it to distillation. The distillate has a repulsive odor and reacts alkaline. When neutralized with sulphuric acid and distilled again in a vacuum, a crystalline body is obtained, which after purification yields a very hygroscopic hydrochloride, soluble in water, alcohol and acetone, insoluble in ether, benzin and chloroform. This volatile alkaloid belongs to the pyridine series of bases and has the composition  $C_8H_{11}N$ .—Pharm. Ztg., liii (1908), No. 3, 26; from Nouv. Reméd., 1907, No. 23.

## UMBELLIFERÆ.

*African Ammoniacum*—*Botanical Source*.—E. M. Holmes observes that hitherto African ammoniac has been attributed in most text-books of materia medica to *Ferula tingitana*, the leaves of which resemble the drug in taste; but the reason for this identification is not quite clear. He had directed attention in 1875 to the probability that if *F. tingitana* were the source of the "feshook," or African ammoniac, it must probably be also yielded by other species of *Ferula*, and with the object of demonstrating this, had secured two living roots of the "feshook" plant from the then Shereef of Morocco. One of these was planted in the Regent's Park Botanic Garden, the other in the Kew Garden, but neither of them led directly to a solution of the question. The subject of the identity of the plant was, however, evidently not allowed to drop at Kew, for Sir Joseph Hooker, having enlisted the services of Mr. G. P. Hunot, then British Vice-Consul at Saffi, secured authentic specimens of the plant yielding the "feshook" gum in 1896, and these have since flowered and identified by Dr. Stapf to

be a variety of *Ferula communis*, L., which he describes under the name of *Ferula Communis*, L., var. *brevifolia*, a plant formerly described as a distinct species by Link, in Roem and Schulte's "Syst. Veg." (vol. V, p. 592). The plant (which is shown in a photolithograph accompanying the original paper) is characterized by having shorter ultimate leaf-segments than the typical form, but occurs along with it almost throughout the area of the species, which extends from the Canaries and Portugal to Constantinople and Syria. A full account of the history of the drug is promised by Dr. Stapf in the "Kew Bulletin."—Pharm. Journ., Nov. 2, 1907, 570.

*Morocco and Cyrenaica Ammoniac*—*Botanical Source*.—In a lengthy treatise on Moroccan and Cyrenian gum ammoniac, O. Stapf states that plants cultivated in Kew, which had been imported in 1886 from Saffi, (Morocco) as mother plants of gum ammoniac, and of which one specimen flowered in 1892, were found to be *Ferula communis*. This settles the question of the botanical origin of the Morocco gum ammoniac, and it is now easier to make comparisons with regard to the relationship between the Moroccan drug and the ammoniac of Dioscorides, whose description of the plant yielding the African drug makes it apparently identical with *Ferula marmarica*, Aschers. et Taub., occurring in Cyrenaica. This kind of ammoniac came, until the conquest of Cyrenaica by the Arabs, undoubtedly from the ports of Cyrenaica and from Alexandria; later, Libya is mentioned as a source of supply. The Moroccan ammoniac was always a coarser kind, in lumps, with many impurities, and is almost completely displaced from the European market by the more granular Persian ammoniac, from *Dorema ammoniacum*. The chemical composition of Cyrenian ammoniac is absolutely unknown. The Moroccan drug has been repeatedly, but incompletely examined; it has a less bitter and much less acrid taste than the Persian ammoniac. On the basis of the facts elicited by his researches, Stapf designates as the mother plant of the Moroccan ammoniac *Ferula communis*, var. *brevifolia*, Mariz. and *Ferula marmarica*, Aschers. et Taub., a distinctly different species, as the plant yielding the Cyrenian drug.—Schimmel's Rep., April, 1908, 14-15; from Kew Bull., 1907, No. 10, 375.

*Russian Anise*—*Adulteration with Coriander*.—Schimmel & Co. mention that in the anise-market at Alexejewka a large admixture of coriander-seed was observed in many cases with the anise offered by the peasants. Some parcels were found to contain as much as 30 per cent. of coriander. Schimmel's Rep., April, 1908, 16.

#### ARALIACEÆ.

*Panax Repens*, Maxim.—*Large Percentage of Non-toxic Saponin in the Rhizome*.—According to Rosenthaler, Stadler and Wentrup the rhizome of *Panax repens*, Maxim., an East-Asian species, contains a relatively

non-toxic saponin (to the amount of 20.8 per cent. ? Rep.), to which they assign the formula  $C_{24}H_{34}(OH)_6O_4$ . Presumably this drug finds similar medicinal use to ginseng, which is valued so highly in Eastern Asiatic countries.—Pharm. Ztg., liii (1908), No. 12, 120; from Ber. d. D. Pharm. Ges., 1907, No. 9.

*Ginseng—Ignorance of the Gatherers a Source of Substitution.*—Speaking in general of the number of widely dissimilar plants that are collected for one and the same drug, O. A. Farwell mentions ginseng as an example. The gatherers, of course, are not botanists, but probably think the plant must grow in their vicinity, and consequently some plant is gathered and sent to the large houses to be identified, if possible, as ginseng. The most common one that comes from the South is *Tetragonotheca helianthoides*, L. The roots of leguminose plants of the *Phaseoleæ* tribe have been offered as ginseng; from the Rocky Mountain regions, the roots of aromatic umbelliferous plants, such as *Angelica liquiticum*, etc., as well as species *frasera*. The latest received was composed of a rhizome of wild yam, *Dioscorea villosa*, Lin., and a young leaf of the mandrake or May apple, *Podophyllum peltatum*, Lin. The one sending it in claimed that the (mandrake) leaf had been growing from the (yam) rhizome.—Drugg. Circ., July, 1907, 459.

*Ginseng—Alkaloidal Constituents.*—According to the investigations of M. J. Galjalo, the active constituents of ginseng root are nearly related, partly to Poehl's "spermine" and partly to "colanine." Indeed, one of these active constituents may be directly regarded as colanine. The physiological action of these bodies manifests itself by depressing the heart's action, languor, drowsiness and insensibility. The "panakvilon," which was first observed by Garrigues, is regarded by the author as belonging to the inactive components of the drug, its action being confined to the gustatory nerves.—Pharm. Ztg., lii (1907), No. 73, 766; from Chem.-Ztg., 1907, Rep., 60.

#### RANUNCULACEÆ.

*Aconite—Fallaciousness of the Assay Process of the U. S. P., VIII.*—Dr. A. B. Lyons observes that up to the publication of the U. S. P., VIII, manufacturing pharmacists in America used only Dr. Squibbs' "physiological" test as a criterion of the activity of aconite and its preparations. It was conceded that a chemical assay of aconite root, provided the drug had not become deteriorated by age, and provided the method was wisely chosen and rapidly carried through, was capable of giving results reasonably trustworthy. Such results were, however, invariably checked up by the physiological test, and consequently the chemical assay was rarely made. The Pharmacopœia, as is well known, does not recognize the physiological test, depending exclusively upon the chemical assay, which the author demonstrates to be fallacious on various grounds. He concludes: (1)

That the present official assay processes for aconite and its preparations should be discarded ; (2) that no chemical assay process for aconite and its preparations should be prescribed which does not include identification of the alkaloid obtained as aconitine and insure the absence of inert alkaloid ; and (3) that official recognition should be given, at least provisionally, to Dr. Squibb's test as the only one by which at present the activity of aconite and its preparations can be practically judged.—*Amer. Drugg.*, Febr. 24, 1908, 89.

*Delphinium Ajacis*, L.—*A Common Source of Commercial Larkspur Seeds*.—Doubting the correctness of classing larkspur seed as being derived from *Delphinium consolida*, L., O. A. Farwell has for several years collected seeds from various commercial lots and raised plants from the same to determine their identity. They invariably proved to be *Delphinium ajacis*, L., and the author therefore considers it safe to assume that most if not quite all the larkspur seed coming into this country is derived from the last named species. As is well known, however, the seeds of most species of larkspur contain the same active (poisonous) constituents, and the seeds of one may therefore be safely employed for the other, with the same medicinal results.—*Drugg. Circ.*, July, 1907, 458.

*Hydrastis*—*Cultivation*.—Calling attention to the increasing scarcity of hydrastis, and that it is likely in time to become extinct as a wild drug, John Uri Lloyd discusses the possibilities of its cultivation. It needs to be kept free from grass, which smothers it, and prevents increase by adventitious buds on the running fibers. For this reason, rather than the necessity of deep shade, natural patches of hydrastis abound only in rich, soft, loamy woodland. Experiments instituted in Kentucky woodlands and in cold frames at the author's home, show that some of the fibers (attached to the rhizome) creep close under the surface of the earth, and throw up adventitious buds which become new plants. These fibers often shoot off to great length, two or three feet if the soil is soft, following locations of least resistance, and may even cast up more than one bud. Thus the patch thickens, regardless of the seed, which when dropped by birds, or otherwise scattered, serve rather as a nucleus for new patches in new locations, than as multipliers in old ones. If a rhizome be sliced transversely into parts carrying buds, they will sprout and increase to a full-grown rhizome. They send out tendrils, producing buds that thicken the patch rapidly, if the plant be in rich loam, free from grass. Under such conditions the plant thrives readily, and there is apparently no reason why hydrastis should not be easily cultivated, and prove a profitable crop after the few years necessary to its establishment. But it is a delusion to look to seeds as the multipliers. Cuttings and adventitious buds on the fibers must be the method of propagation. The paper is illustrated by cuts showing the various developments mentioned.—*Pharm. Rev.*, May, 1908, 138-140.

*Nigella Species—Alkaloidal Constituents.*—Supplementary to an investigation of *damascenine*, the alkaloid from the seeds of *Nigella damascena*, Dr. Oscar Keller now communicates the results of a comprehensive study undertaken with the object of ascertaining the presence and kind of alkaloids in the seeds of other species of *Nigella*, for which purpose the following were available: *Nigella aristata*, *N. arvensis*, *N. hispanica*, *N. orientalis*, *N. garidella*, *N. interegifolia*, and *N. diversifolia*. All of these species, together with at least eight more, are indigenous in the Mediterranean flora; but a few of them have spread to Central Europe, for example, *N. arvensis* and *N. sativa*, while others, such as *N. damascena* and *N. aristata*, are valued as ornamental plants, and are cultivated in gardens in Germany: The author's results show that, aside of *N. damascena*, only the seeds of *N. aristata* contain appreciable quantities of alkaloid; that those of *N. arvensis*, *N. hispanica* and *N. orientalis* at most contain only mere traces, if any, and that the seeds of the other species contain no alkaloid at all. It was, furthermore, proved that while the seeds of *N. damascena* contain only *damascenine* (about 0.5–0.6 per cent. as hydrochloride), *N. aristata* seeds contain both *damascenine* and a second alkaloid, which the author has named (provisionally?) "methyldamascenine," the two bases, present in about equal proportions, amounting to 1 per cent. as hydrochloride. *Methyldamascenine* proves to be a well characterized individual body; a secondary base, having properties closely related to those of *damascenine*. Analytical data lead to the formula  $C_{10}H_{13}NO_3$ . In addition to this base the author has observed a third basic substance, but the quantity obtained was too small to permit complete characterization and to establish its identity, although the single platinum determination agrees well with the assumption that this third base may be regarded as "doubly methylated *damascenine*." The author's very voluminous paper is mainly devoted to the chemistry of the several bases, which must be consulted in the original, in Arch. d. Pharm., 246 (1908), No. 1, 1–50.

## MAGNOLIACEÆ.

*Star Anise—Grouping of Species According to the Number of Carpels.*—Several cases of poisoning by star anise in Switzerland and Austria have given the incentive to C. Hartwich to review the literature concerning the characters of distinction of the fruits of the different species of *Illicium*. This very thorough and painstaking review is characteristic of the author, who concludes his paper with a brief résumé of the different fruits heretofore described, grouped according to the number of carpels, as previously applied on a limited number by Holmes (see Proceedings, 1881, 186), but in somewhat different arrangement. The paper is accompanied by two tables, illustrating the distinguishing characters in shape and size of the carpels of the different fruits. The grouping is as follows:

## I. FRUITS WITH 8 CARPELS (very rarely more).

1. *Illicium religiosum*, Siebold et Fuccarini.—Poisonous.
2. *Illicium micranthum*, Dum.—From the Kew Herbarium (not in the Index Kewensis). China. The carpels are moderately slender, the point or beak depressed, and strikingly diminutive in size; the scar comparatively large. The columella is sunken and does not reach the surface; the seed light brown; the raphe of the seed prominent, but not reaching far downward.
3. *Illicium Henryi*.—From the Kew Herbarium (not in the Index Kewensis). China. Carpels slender, with long-extended beak; scar, comparatively small; seed, bright.
4. *Illicium cambodianum*, Hance.—From the Kew Herbarium. China and Cambodia. Carpels as under 3. Columella sunken.
5. *Illicium parviflorum*, Michx.—North America. Poisonous. The author has not seen this fruit, and is in doubt whether it belongs to this group. According to Holmes, it has 8 carpels, according to Lanessan, 10 to 15.

## II. FRUITS FREQUENTLY WITH MORE THAN 8 CARPELS.

6. *Illicium verum*, Hook. f., "The Genuine Star-Anise." This is placed by Holmes in the first group. Of 28 fruits, 16 had 8 carpels, 4 had 9, 3 had 10, 4 had 11, and 1 had 13 carpels. These variations justify placing this species in a separate group, which thus forms a transition from the first to the third group.

## III. FRUITS HAVING USUALLY 13 CARPELS.

7. *Illicium floridanum*, Ellis.—North America. Poisonous. Carpels somewhat more slender and smaller than 6, but the scar much larger. According to Schlotterbeck (Proceedings, 1902, 885) out of 20 fruits, 15 had 13 carpels, 1 had 10, 2 had 12 and 2 had 14 carpels. Five fruits from the Isola Madre, Lago Maggiore (observed by the author) had 13 carpels each.

8. *Illicium Griffithii*, Hook. f. et Thoms.—From the Museum of the Pharmaceutical Society, London. Himalaya. Form of carpels not materially different from 6, but the scars are much larger. Two fruits in the author's possession had 13 carpels, and Holmes' illustration (see Proceedings, 1881, 188) also shows 13 carpels.

9. *Illicium majus*, Hooker.—From the Museum of the Pharmaceutical Society, London. Burma. The carpels are the highest of all, and the scar is large. Two fruits examined by the author had 13 carpels, and this number is also shown in Holmes' illustration (l. c.).

Besides *Illicium religiosum* only the two American species (5 and 7) have been designated as being "poisonous," but that such designation is not made in reference to others does not prove that they are not poisonous. While the author has not considered the odor or taste in his paper, he expresses the opinion, based both on his personal experience and the

statements in the literature, that the fruit of *Illicium verum* is the only one that has the flavor and taste of anise.—Schweiz. Wechschr. f. Chem. u. Pharm., xlv (1907), No. 51, 798–809.

*Poisonous Star Anise—Seat of the Poison and Simple Method of Identification.*—C. Hartwich mentions that at his request Professor Cloetta has recently undertaken physiological experiments with poisonous star anise, which have demonstrated that the seat of the poison is not in the seeds of the fruit of *Illicium religiosum*, as is repeatedly stated in the literature, but in the pericarp, and that the poisonous constituent is not sikiminic acid, but sikimin, as already previously determined by Eykmann. Moreover, these experiments have shown that the toxicity of the fruit is surprisingly powerful, the lethal dose in the instance of a dog weighing about 6 kilos being about 4 Gm. of the fruit, and in another of the same weight 0.02 Gm. of sikimin. Concerning the distinguishing characteristics of the poisonous from the non-poisonous star-anise fruits, Hartwich finds that the simplest, and at the same time, most positive is the taste. Poisonous star anise does not have the taste of anise. It suffices to chew the carpel of a suspected fruit; if it does not have the characteristic anise taste, it should be rejected.—Ibid., pp. 799 and 800.

*False Star Anise—Occurrence in French Commerce.*—V. Harlay calls attention to the recent occurrence of fruits of *Illicium religiosum* in a parcel of star anise from a Paris wholesale house. In this sample the fruits of *I. religiosum* were not, as generally stated, more irregularly stellate from the presence of aborted carpels than those of *I. verum*; on the contrary, they were more regular, and when separated had a better appearance than those of the true drug. The seeds, however, were much paler, and markedly rounder, so that when the mixed broken pieces and seeds at the bottom of the parcel were thrown on a slightly inclined plane, the seeds of *I. religiosum* rolled down, while those of *I. verum*, being flatter, remained stationary. The inner surface of the endocarp of *I. religiosum* was also paler than that of true star anise. When a portion of a carpel of the suspected fruit was chewed, that of *I. religiosum* immediately gave an intense acid taste, followed by a somewhat camphoraceous flavor, totally distinct from the characteristic sweet, anise taste of the true drug.—Pharm. Journ., Feb. 22, 1908, 223; from Journ. de Pharm. et Chim., 27 (1908), 112.

#### BERBERIDACEÆ.

*Achlys Triphylla—A New Cumarin Plant.*—C. E. Bradley calls attention to a new cumarin plant—*Achlys triphylla*—which abounds in the Cascade Mountains, from British Columbia to California, where it is known as “elk weed,” but is more frequently called “wild vanilla” on account of its odor. The air-dried plant yielded by the method of Reinsch 0.20 per cent. of cumarin.—Pharm. Ztg., lii (1907), No. 66, 689; from Jour. Amer. Chem. Soc., 29, 606.

## MENISPERMACEÆ.

*Calumba*—*Researches on the Alkaloidal and Bitter Principles*.—The investigations of Prof. J. Gadamer (1902) have shown that calumba root contains at least two alkaloids which are not identical with berberine, and that the latter alkaloid is not a constituent of this root (see Proceedings, 1903, 778) ; that these calumba alkaloids—which have since been named

*Calumbamine* and *Jateorrhizine* respectively—are yellow, and form by reduction colorless hydro compounds which, in distinction from the parent substance, may be shaken out with ether, and that these calumba alkaloids are, like berberine, quaternary bases, which by reduction are converted into tertiary hydro compounds. Prof. Gadamer, having first referred the further examination of these bases to E. Günzel, has more recently delegated the study of these, with the particular object of definitely determining their empirical and, if possible, their constitutional formulas, to K. Feist, who now reports the character and results of his researches in a comprehensive paper. In the course of these researches, Dr. Feist succeeded in isolating and studying also a third alkaloid, which he has named

*Palmatine* ; and, taking up incidentally also the study of the bitter principles of calumba root—columbin and columbic acid—he has met with another bitter substance possessing close resemblance to the two heretofore known. Referring to the original paper for the details of the author's investigations, the results, in so far as they apply to the alkaloids, and the bitter principle, will be found under *Organic Bases* and *Glucosides*, respectively, in the section on "Organic Chemistry" of this report.—Arch. d. Phar., 245 (1907), No. 8, 586–637.

*Calumba*—*Bulk of Active Principles in the Cortex*.—In the course of some investigations concerning commercial tinctures of calumba, R. H. Parker prepared tinctures of decorticated roots, and from the cortical shavings, for the purpose of comparison with a tincture prepared from a suspicious sample of calumba purchased in "No. 40" powder. The latter tincture was very dark brown in color, was devoid of bitterness, and gave a considerable yellow precipitate on dilution with acidulated water, while on dilution with aqueous KHO, a brilliant dark red color, free from yellow tint, was developed. The "No. 40" powder is, therefore, believed to be produced from the "False Calumba Root" (which see), described by Mr. S. Taylor. With regard to tinctures prepared from true calumba (both the purchased tinctures and those prepared by the author), they were all characterized by not forming precipitates on dilution with acidulated water, and by becoming only pale orange to deep orange with alkaline water—the original color of the tinctures varying from pale yellow to brownish-yellow. They were all bitter ; but the pale yellow tincture prepared from the decorticated root was only feebly bitter, the bitterness increasing with the depth of color, and the strongest bitter of all being the



dark orange-colored tincture obtained from the cortical shavings of calumba roots.—Pharm. Journ., Aug. 3, 1907, 181-182.

*False Calumba Root—Distinguishing Characters.*—S. Taylor has determined the microscopic characters of a sample of a sliced root which had been detected by a London wholesale house mixed with calumba root. The sample examined did not have the characteristic bitter taste of calumba; it measured 6.5 Cm. long, 3 Cm. broad, and 0.5 to 0.8 Cm. thick, and had been cut from a root of 5.0 Cm. diameter in a very slanting direction. In general appearance the slices of root much resemble poor qualities of calumba root, but are distinguishable from that drug by their brownish appearance, which is particularly striking, pervading all parts of the root. The general microscopic characters are closely akin to those of calumba. As in the latter, starch is very plentiful, and the grains are about the same size, but the hilum of the grain is different, and is also less distinct. Crystals of calcium oxalate exist in two forms, as acicular raphides, large and numerous, and as rosettes. They are distributed through all parts of the root, as is the brownish-red coloring matter, which is very plentiful, and these two facts are sufficient to distinguish the false root from the true. The author failed to detect the presence of alkaloid by the usual method of extraction, but on extraction with petroleum-ether there was a yield of a very minute quantity of white acicular crystals, much too small in quantity for examination.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1907, 474-476.

#### RUTACEÆ.

*Brucea Antidysenterica, Lam.—Chemical Examination of the Fruit.*—In a paper communicated to the Brit. Pharm. Conference in 1903, on Kô-sam Seeds (the fruit of *Brucea sumatrana*, Roxb.), (see Proceedings, 1904, 687), it was noted in conclusion that it would also be of interest to determine the constituents of the closely allied Abyssinian plant, *Brucea antidysenterica*, Lam., which, on account of the properties indicated by its name, is highly esteemed in its native country. Frederick B. Power and Arthur H. Salway are now able to report the results of a chemical examination of the fruits of the Abyssinian plant, which they summarize as follows:

The more important constituents of the fruit of *Brucea antidysenterica*, Lam., are:

1. A fatty oil, amounting to 22.16 per cent. of the weight of the fruit. This oil, on hydrolysis, yielded chiefly oleic acid, together with a small amount of an acid having a higher degree of unsaturation, which is probably linolic acid; considerable amounts of palmitic and stearic acids, and a very small quantity of acetic and butyric acids. It afforded, furthermore, a small amount of a phytosterol,  $C_{30}H_{48}O$ ,  $H_2O$  (m. p. 135-136° C.), whilst another phytosterol, melting at 147° C., was obtained from the petroleum extract of the resins.

2. A small amount of free volatile acids, consisting of a mixture of formic and butyric acids.

3. A quantity of resinous substances, corresponding to about 1 per cent. of the weight of the fruit. From these, with the exception of a small amount of the above-mentioned phytosterol, nothing crystalline could be isolated.

4. A bitter principle, or possibly a mixture of such principles, which could only be obtained in an amorphous form.

5. A considerable quantity of amorphous, yellow coloring matter.

6. A large amount of a sugar, which yielded an osazone melting at 205° C., and was therefore evidently glucose.

The constituents of the fruit of *Brucea antidysenterica*, Lam., are thus found to be very similar in character to those of the fruit of *Brucea sumatrana*, Roxb. ("Kô-sam Seeds"), and it may consequently be assumed that the two species possess similar medicinal properties. The bitter principles appear, however, to be contained in relatively larger amount in the fruit of *Brucea sumatrana* than in that of the Abyssinian species, and in view of the difficulty experienced in collecting the fruit of the latter it is not probable that it will acquire a very extended use. Dr. Salway and Walter Thomas also contributed a paper on comparative chemical examinations of the

*Barks of Brucea Antidysenterica, Lam. and Brucea Sumatrana, Roxb.*, which show that these barks also contain some bitter substances, but in neither case have these been isolated in definite form. In view of the difficulty of obtaining any quantity of the bark of *Brucea sumatrana*, and the fact that it contains a much smaller proportion of bitter principles than the fruit, it would appear that the latter is to be preferred for medicinal use.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1907, 477-492.

*Brucea Sumatrana, Roxb.—Medicinal Uses in China.*—Speaking of the medicinal virtues of the plants belonging to the genus *Brucea*, of which there are five or six species in tropical Africa, Asia and Australia, O. A. Farwell mentions that *Brucea sumatrana*, Roxb., is distinguished from all the others by its sharply toothed leaflets, instead of being entire or undulate. It ranges from the eastern peninsula of India and Cochin China through the Indian Archipelago to the Philippines and Australia. All parts of the plant may be used as a tonic-bitter and astringent in the treatment of dysentery, worms, hemorrhages and fevers. The fruit in China is called khosam or kosam and is esteemed especially good as a stomachic, to stop hemorrhages, and in dysentery. The Chinese make a practice of steeping it in hot water to destroy its vitality when wanted by foreigners, so that the tree cannot be grown by them.—Drugg. Circ., July, 1907, 459.

*Aniseed-Buchu—A New Variety.*—C. Edward Sage directs attention to a parcel of buchu recently offered in the London market by the descriptive name of "aniseed-buchu." The drug has the appearance of Karoo-buchu (derived from *Diosma succulenta*), which was described by the author in 1904 (see Proceedings, 1905, 644), but it possesses a different odor altogether, resembling that of anise and cowslip flowers. The leaves are ovato-lanceolate in shape, with a prominent midrib and a coriaceous texture; size, 5 to 8 Mm. long and 3 Mm. broad; inflorescence, an umbel with an involucre of bracts; fruit, anetærio of glabrous carpels, each of which contained a black seed. The Curator (Mr. Holmes? Rep.), suggests that this drug is derived from *Agathosma variabilis*, Lond. (Rutaceæ), but positive identification will be more possible when some plants have been raised from the seeds.—Pharm. Journ., Feb. 1, 1908, 125.

*Buchu Leaves—A New Variety.*—E. M. Holmes directs attention to a new form of buchu leaves offered in the London market, which might easily be accepted as a small form of *Barosma betulina*, having the same twisted appearance as the latter and similar color. They differ, however, in the fact that the leaf is rounded at the base and broader there than at the apex, having an ovate outline, whereas those of *B. betulina* are broader at the apex and taper towards the base, and have an obovate outline. Moreover, they have a distinctly different odor and flavor recalling that of citronella, mixed with an indefinite odor of a buchu character. In shape they vary from ovate to lanceolate, being 7 to 12 Mm. long and about 4 Mm. broad. The margin of the leaf appears to be thickened, due to the large oil glands being close together and nearly filling up the shallow crenations at the edge of the leaf. The apex of the leaf is obtuse. There are no glands visible on the surface of the leaf, these being immersed below the surface. The leaf has a very short pedicel about 1 Mm. long. These characters belong to

*Barosma pulchella*, B. & W., a species nearly allied to the official buchu, and occurring on Table Mountain in various localities.—Pharm. Journ., Nov. 9, 1907, 598.

*Simaruba Bark—Constituents.*—Ch. Gilling has made an investigation of the constituents of simaruba bark, which confirms the results obtained by Greenish and Hooper some years ago. These investigators had found a colorless, crystalline bitter substance, a colorless, crystalline bitterless substance, a yellow resin having green fluorescence, and a brown resin. Gilling has now determined the bitter principles to have the composition,  $C_{27}H_{30}O_8$ . The bitterless crystalline substance is present in the bark only in very small quantity, insufficient for the present examination.—Pharm. Ztg., liii (1908), No. 48, 478; from Ztschr. f. angew. Chem., 1908, No. 21.

*Maracaibo Simaruba Bark—Substitution of Stem-bark for Root-Bark.*

—The "Chemist and Druggist" observes that for some time past a *simaruba* bark, termed *Maracaibo simaruba*, differing essentially from the usual kind, has appeared in the European market, and is apparently the scraped stem bark in place of root bark of *Simaruba officinalis*. It occurs in varying lengths, and about  $\frac{1}{25}$  in. thick. The outer surface is variegated with yellow on a white background, and the inner surface is brownish-yellow with broad furrows; the fracture is short and not fibrous. As histological features, the presence of starch in this stem-bark is distinctive from the root-bark. The bark consists of bast, since cork cells and cortical parenchyma are absent, the outer portion containing masses of stone cells (sclerotic cells) separated by medullary rays, which appear as fissures under low-power magnification, while fibrous cells (sclerenchyma) compose the inner portion. The taste is bitter, like that of the root-bark.—Chem. and Drugg., June 20, 1908, 937.

#### STERCULIACEÆ.

*Cacao*.—The cocoa-bean situation in the summer of 1907 from a commercial standpoint, is the subject of a communication by A. M. Hance to this Association, in Proceedings, 1907, 568–573.

*Cacao-Shells—Copper a Natural Content in Some Sorts*.—In the examination of cacaos and chocolates the question of a copper content has engaged the attention of only a few investigators. Its presence was first noticed by Duclaux, who regarded copper as a normal constituent, and also by Galippe (1883), who found it in amounts of 0.00112 to 0.00288 per cent. in four different sorts of cacao. C. G. Bernhard (1890), on the other hand, examined the ash of a large number of cacao seeds and shells, but was unable to detect the presence of copper in any of them. Ed. Tisza has now completed a series of experiments upon cacao-shells from eight different sources, and found copper in four of them, and none in the remaining four. In two sorts from Ecuador, he found traces in one (Machala-Guaiaquil), and 0.0044 per cent. in the other (Aniba-Guaiaquil); in four sorts—two Venezuelan (Puerto-Cabello and Campano), one from the Antilles (Trinidad), and one from Brazil (Bahia), he found copper to be absent; and of the remaining two, one from the African Island of St. Thomas contained 0.0108 per cent.; the other, a Ceylon sort, containing 0.0006 per cent. of copper. The author concludes that when small quantities of copper are found in cacaos or chocolates, its presence may be regarded as natural; but his experiments also prove that copper is not invariably a constituent of cacao-shells, and when present it is always variable in quantities.—Schweiz. Wchschr. f. Chem. u. Pharm., xlv (1907), No. 35, 526–528.

*Kola Nuts—Constituents*.—After a critical review of the constituents of kola seeds, Perrot and Goris come to the conclusion that only three well-defined bodies have been isolated from this drug, viz., caffeine, theobro-

mine, and kolatin. The last named has been obtained from fresh seeds, in small, white colorless crystals, of the formula  $C_8H_8O_4$ , slightly soluble in water, readily soluble in alcohol, acetone, and acetic ether. Its solution has the property of dissolving caffeine and theobromine, as solutions of sodium benzoate and salicylate do, but in smaller proportion. Under suitable conditions of oxidation it yields kola-red, a body allied in its nature to the phlobaphenes. Kolanin is only a mixture, probably mechanical, of kola-red and caffeine; it is not glucosidal, and cannot be considered one of the constituents of the seeds.—Pharm. Journ., Jan. 11, 1908, 31; from Bull. des Sci. Pharm., 14 (1907), 576.

## TILIACEÆ.

*Maqui Berries*—Used as a Coloring for Wines.—E. M. Holmes states that the small fruits of *Aristotelia maqui* have recently been offered at the London drug market under the name of "maqui berries," although for the last twenty years these berries have been imported from Chili into France, where they are used for coloring wines, taking the place of elder berries formerly used for this purpose. As imported, the maqui berries are about the size of black pepper, and, like the fruits of *Rhamnus cathartica*, show four segments, each containing a triangular seed. Except that they exhibit no trace of an adherent calyx, they might easily be mistaken for buckthorn berries. In Chili the fruits are considered edible, and a wine prepared from them by the native Indians, which they call "Técu," is used in fevers, while the leaves of the plant are used for preparing an astringent gargle and for poultices applied to swellings.—Pharm. Journ., Nov. 16 (1907), 639.

## TERNSTREMIACEÆ.

*Tea Flowers*—Use and Superiority for Making Tea.—Perrot and Goris call attention to the introduction of dried tea flowers into commerce for the preparation of a beverage by infusion, which is stated to have an extremely delicate aroma. Tea is made from these flowers thus: A tea-spoonful of flowers is taken for each cup of tea to be made, and just sufficient boiling water to cover them is poured upon them in a covered tea-pot. After infusing for ten minutes exactly the quantity of boiling water to make up the number of cupfuls required is added; after a few minutes' infusion, the tea is served. Two kinds of tea flowers are put on the market, "black" and "green." The difference is probably due to the drying. Commercial tea flowers contain about 2 per cent. of caffeine. The ash contains a notable amount of manganese and of iron, probably due to the presence of a considerable quantity of the oxydase, thease. The use of the flowers for tea-making presents several advantages. The gathering of the crop does not harm the plant. The preparation of the dried flowers requires much less care than that of the leaves. The

product is more uniform in quality and flavor. Adulteration would be extremely easy to detect. The storing of the dry flowers might necessitate a little more care than in the case of the leaves.—Pharm. Journ., Sept. 21, 1907, 381; from L'Union Pharm., 48, (1907), 301.

*Tea—Determination of Damage by Sea Water.*—J. Martenson states that a determination of chloride is sufficient to establish damage in tea occasioned by sea water. Normal, undamaged tea, in five examples, showed the presence of 0.0545 per cent. of Cl, whilst damaged teas gave very much higher chlorine values. Again, if normal tea is wetted with a little water and exposed to warmth, mould soon forms upon it; whereas in tea moistened with sea water no fungi, or at best only a very insignificant development of fungi occurs.—Pharm. Ztg., liii (1908), No. 21, 213; from Pharm. Post., 40, 912.

#### GUTTIFERÆ.

*Garcinia Fats—Varieties and Constants.*—David Hooper directs attention to a number of fats derived from different species of *Garcinia*, which are found in the Indian markets or are applied by the native East Indians to a variety of uses. Koham (or Goa) butter, the concrete oil of *Garcinia indica*, is an article of commerce in Bombay. The seeds of *G. echinocarpa*, Thw., the "Madol" of Ceylon, afford a thick oil used by the Cingalese for burning in their lamps. Regarding *G. cambogia*, Desrouss, Cherry mentions an oil obtained from the tree which is used in the Nilgiris for medicine. The seeds of *G. tonkinensis* yield an oil in Cochin China. In addition to these, the Gamboge tree, *G. morella*, Desrouss, (*G. pictoria*, Roxb.) yields a semi-solid fat which has long been used in Mysore for domestic purposes. The tree is common in forests of Western India, and is also frequent in Ceylon. The author has determined the constants in two samples of this "gamboge butter," from different localities, the one designated as the ghee from "Murga" seeds, the other as the ghee from "Gurgi" seeds, and compares them with the constants obtained with "Koham (or Goa)" butter, derived from *Garcinia indica*, Choix. The results are exhibited in the following table:

—	Murga.	Gurgi.	Koham.
Specific gravity at 50° C.....	0.900	0.902	0.9106
Melting-point.....	37° C.	33.5° C.	43° C.
Acid value.....	3.49	13.79	41.3
Saponification value.....	198.20	194.74	191.5
Iodine value.....	53.72	55.46	25.0
Reichert-Meissl value.....	0.69	0.62	0.978
Percentage of fatty acids.....	94.89	95.20	93.5
Melting-point of fatty acids.....	56° C.	55° C.	61° C.
Iodine Value of fatty acids.....	56.38	57.81	

It is interesting to notice in these two fats that the constituent parts are

almost identical; but while in the fat of *Garcinia indica* the olein is present in the proportion of one to two of stearin, forming oleo-distearin, in the fat of *G. morella* the olein is present in the proportion of two to one of stearin, forming stearo-diolein.—Pharm. Journ., Sept. 7, 1907, 335.

## AURANTIACEÆ.

*Blood Oranges—Artificial Coloration and Sweetening.*—A remarkable case is noted in "D. Med.-Ztg." (1908, No. 21) which confirms the practice, repeatedly denied, that oranges are artificially colored (and sweetened) and supplied as "blood oranges." It appears that a girl after eating such an orange (at St. Petersburg) was attacked with a sudden hemorrhage, resulting from a fragment of a hypodermic needle which had been broken off in the orange. On examination of the extracted needle-fragment this was found to contain some remains of anilin color, and a further examination of "blood oranges" of the same lot showed that all of them had been treated with injections of red aniline and saccharin solution.—Pharm. Ztg., liii (1908), No. 29, 290.

## VITACEÆ.

*Mavrodaphne Wine—Production in Greece.*—According to J. Boers the sweet wines of Greece are not as strong as the Hungarian (Tokay) wines. This appears to be due to climatic conditions, however, which interfere with the proper fermentation. Thus, the brown-red "Mavrodaphne" grapes contain from 28–33 per cent. of sugar and are usually dried by the sun a short time before expressing the must. The fermentation usually also goes on regularly and smoothly until about 8–9 per cent. of alcohol is formed, after which, owing to the climatic conditions prevailing in Greece, there is danger of acetic fermentation, which is intercepted by the addition of alcohol. In this way, sweet wines containing from 12–14 per cent. of alcohol are obtained. The odor, taste and color of the Mavrodaphne wine so produced is very similar to those of Tokay wine.—Apoth. Ztg., xxii (1907), No. 103, 1128.

*Wine—Acetylmethylcarbinol a Product of its Acetone Fermentation.*—Two years ago, J. Pastureau recorded the occurrence of acetylmethylcarbinol in certain commercial vinegars. It is now found that this body is a normal and constant product of the acetous fermentation of wine, and is probably produced by the action of *Mycoderma vini* and of *M. aceti* and other oxidizing bacteria on isobutyglycol, which is a normal constituent of wine. Wines, which before being submitted to acetous fermentation were proved to contain no methylacetol, were found after this fermentation to yield from 0.3 to 0.5 Gm. per liter. The fermented liquid, when neutralized and distilled, afforded a distillate which had a marked reducing action on silver ammonio-nitrate and on Fehling's solution, and gave with phenylhydrazine acetate the osazone, melting-point

243° C.—Pharm. Journ., Febr. 8, 1908, 151; from Journ. de Pharm. et Chim., 27 (1908), 10.

#### ERYTHROXYLACEÆ.

*Coca—Cultivation of the Small-Leaved Variety in Java.*—Dr. G. van der Steen having expressed the opinion that the planters in Java are working on the wrong lines in cultivating the small-leaved coca, which contains principally cinnamyl and isotrophyl cocaine, and is of no intrinsic value, except as a source of ecgonine, Dr. de Jong says in reply, that this disadvantage is more than counterbalanced by the facts that the small-leaved coca grows more rapidly and gives a better yield of leaf, containing twice as much "total alkaloid" as the large-leaved Peruvian plant. If, however, planters in Java care to try the latter, he is prepared to supply them with seed. He also makes several practical suggestions to coca planters, the most important of which are that the plants should be grown on rich and well-manured soil, and that they should be cultivated as a secondary crop in the shade of other plants. Perhaps the most interesting recommendation is that planters should combine to start a cocaine factory in Java, since the manufacture of the alkaloid is, in his opinion, the most remunerative part of the business. He has made the suggestion before, but it has not been acted on owing to the opposition of interested European alkaloid makers. The preparation of cocaine should, however, offer good prospects in Java, since the native labor is cheap, and efficient when working under European supervision, and land is also obtainable at low rates, and there would be a considerable saving in transport. He recommends that the crude cocaine made should be put into square, wide-mouthed bottles, which could be packed in empty kerosene tins. At first only crude cocaine should be made, but eventually pure cocaine, suitable for immediate use in medicine, should be manufactured.—Chem. & Drugg., June 20, 1908, 937; from "Teysmannia," 1908, 233.

#### POLYGALACEÆ.

*Senega—Adulteration with the Stem-bases of the Plant.*—O. Tunmann calls attention to an adulteration of senega with the stem-bases of the plant to the amount of 20–30 per cent., which he observed in the finely concised drug customarily supplied in the German drug market. These cuttings of stem-bases are recognized by a resemblance to the concised rhizomes of *Triticum repens*. They consisted of segments about 3–5 Mm. long, 2 Mm. thick, cylindrical, almost always hollow, and yellowish in color. The presence of these stem-bases in the powdered drug is easily recognized by the white, strongly refractive, non-liquified bast-fibers, which distinguish them from the elements present in the rhizome. Furthermore, the micro-chemical examination determines the presence of only traces of saponin in the stem-bases. They gave only a yellow coloration with sulphuric acid and alcohol, with here and there in the sieve por-



tion the characteristic red color, indicative of mere traces of saponin. It follows that an admixture of stems must in proportion to the amount present reduce the therapeutic efficiency of the drug.—Pharm. Centrall., xlix (1908), No. 4, 61-64.

#### PAPAVERACEÆ.

*Opium—Cultivation in India.*—Some interesting particulars concerning the cultivation of opium in India are given in a consular report by Mr. W. H. Michael, Consul-General at Calcutta, which are reproduced in Pharm. Journ., Sept. 7, 1907, 335-336.

*Opium Assay* with the use of lead subacetate is the subject of a paper by C. E. Parker, in the "Proceedings" of this Association, 1907, 490-497.

*Opium Assay—Increase of Morphine-Precipitate on Prolonged Standing.*—In various opium assays, particularly in opium of high morphine percentages, G. Fromme obtained a morphine which showed increasingly greater differences between weighings and titration, corresponding to the intervals during which the morphine remained in contact with the liquid from which it was precipitated. Thus, while the morphine, immediately separated after shaking for 10 minutes, showed a difference of only 0.05 to 0.15 per cent. between weighing and titration, that filtered off after 24 hours' standing exhibited differences up to 0.4 per cent. Inasmuch as the absence of color of the separated morphine precluded the presence of ordinary impurities (such as coloring and extractive substance), the author conjectures that the increase in the weight of morphine is attributable to the separation of other opium alkaloids on prolonged standing.—Pharm. Ztg., lii (1907), No. 74, 778.

#### CRUCIFERÆ.

*Mustard Seed—Cultivation in California.*—Felix J. Koch gives an interesting account of the cultivation of mustard seed in the Lompoc Valley, California, from where, he avers, comes practically all the mustard in medicinal use the country over to-day. From an interview with the sole distributor of the annual output, the "mustard king" of the little town of Lompoc, he learns that there are two kinds of mustard seed raised—the red and the yellow. The red, known as the Trieste seed, is the preferred kind, and brings the best price. A fair crop of this will range about a ton to the acre, and some years even more. The seed for this is sown broadcast with the seeder January and February, the exact time depending on the rain, being the season for the red sort, March for the yellow. Sediment land is required for this cultivation, which appears to consist simply of sowing and reaping, no attention being required, or possibly before the plants have ripened for the harvest about September. The seed comes up in about a week or ten days, and the plants bloom in June, a delicate yellow for both varieties, but the red mustard having the finer, more delicate

blossoms, so that a field is a pretty sight, even without the rich fragrance. The crop is reaped with a reaping machine, just as ordinary grain, but the threshing-out of the seed is distinctly different, being done by huge rollers of iron or wood 5 or 6 feet in diameter, resembling largely the implements with which lawns are rolled, drawn by horses. The straw having been removed from the sheets on which this is done, the seeds are collected in the center of the sheet, and then placed on the sifting frames, which, working back and forth, permit the seed to drop through, but hold the chaff; thence seeds are passed through a fan-mill into sacks of 85 or 90 pounds, never over 100. Some hundred and fifty thousand sacks have thus been raised in this valley in a single season.—Merck's Rep., April, 1908, 92-93.

*Turnips—Characters of Volatile Oil from the Outer Peel.*—In the course of an investigation of the volatile oil of *Cardamine amara*, L. (which see under "Organic Chemistry") the attention of Max Kuntze was directed to the marked resemblance of its odor to that of the volatile oil of the common turnip (*Brassica rapa* var. *rapifera*, Metzger), which led him to suspect the identity of the two cruciferous oils, and to undertake experiments with the object of confirming his suspicion. In the course of these experiments he found that, as in the case of mustard oils in general, the volatile oil does not exist ready formed, but that it is produced from a glucoside by the action of a ferment in contact with water, both of which are present in the exterior portions or peel of the turnip; the interior tissues of the root containing principally albuminoid substances, sugar and salts, with much water, but neither glucoside or ferment. From the peels of several cwt. of turnips he obtained by appropriate treatment and distillation, shaking out of distillate with ether, etc., a small quantity of a brown oil, and from this he was enabled to separate 1.8 Gm. of a thio-urea, by the same method as that by which the thio-urea was obtained from oil of cardamine. Forming colorless leaflets, melting at 137° C., it was at first assumed to be identical with the cardamine thio-urea, namely secondary *d*-butyl-thio-urea; but closer examination showed marked distinctions from this in its optical behavior and in the sulphur content, both of which, as well as the melting-point (137° C.) pointed to its identity with "phenylæthylthio-urea" ( $C_6H_{12}N_2S$ ). Like this, it was optically inactive and contained 17.98 per cent. S.; whereas the secondary *d*-butyl-thio-urea is optically dextrogyre and contains 24.25 per cent. S.—Arch. d. Pharm., 245 (1907), No. 9, 660-661.

#### CUCURBITACEÆ.

*Cucumis Trigonus*, Roxb.—*Colocynthin-like Constituents in the Fruits.*—W. A. H. Naylor and E. J. Chappel report the results of a chemical investigation of the dried fruits of *Cucumis trigonus*, Roxb. (*C. pseudo-colocynthis*, Royle), which Dymock in his "Materia Medica of Western

India" describes as a very common plant in the Bombay Presidency, but that he has never known the fruit to be used medicinally; that the fruit ("Karel" in the vernacular) is of the size and shape of a small egg, and, although very bitter, is sometimes eaten by the natives. Using Hencke's method for the extraction of colocynthin, the authors obtained from this pseudo-colocynth a principle identical with or closely related to colocynthin, which they also prepared for the purpose of comparison from *Citrullus colocynthis*. The authors' investigations have demonstrated, furthermore, that

*Colocynthin* may be obtained in a crystalline state, despite the failure of Hencke and Wagner to induce it to assume a crystalline form; that notwithstanding the doubts cast by Hencke upon its decomposition by acids into colocynthein and sugar, their results confirm on the contrary those of Johnson that colocynthin is capable of hydrolysis, and that it yields, among other products, colocynthein and elaterin, and a glucose. Also, that colocynth contains a white crystalline body agreeing in its general characters with the "colocynthetin" of Walz. Finally, the author's report that a sample of colocynthin purchased from a reliable firm of manufacturers, although labeled "Colocynthin Puriss.," was found to differ markedly from the specimen prepared by themselves, and contained a considerable proportion of impurity.—Trans. Brit. Pharm. Conf. (Year-book of Pharmacy) 1907, 402-406.

#### COMBRETACEÆ.

*Combretum Raimbaulti*, Heckel—*A West African Fever Remedy*.—The leaves of *Combretum Raimbaulti*, Heckel, which are valued in West Africa, under the native names "kiukelibah," "kkassao," and "sekhaon," as a remedy in malaria and the so-called black water fever, have recently also been introduced and received some attention in Germany. R. Mueller, after giving a description of the pharmacognostic and microscopic characters of these leaves, mentions that the drug contains neither alkaloidal nor glucosidal constituents. Besides about 22 per cent. of tannin, only potassium nitrate has been positively identified. The epidermal cells are, however, filled with a solid, brown, perfectly homogeneous mass, which is insoluble in the ordinary solvents—such as water, alcohol, ether, solution of potassa, etc.—but is colored greenish by iron salts. Isolated crystalline druses, enclosed in roundish cells, were observed in the mesophyll.—Pharm. Ztg., lii (1907), No. 73, 766; from Pharm. Praxis, 1907, No. 7.

*Combretum Sundaicum*—*Proximate Examination*.—E. F. Harrison reports in detail the experiments undertaken with the object of separating any active principles of the Malayan anti-opium plant, *Combretum sundaicum* (see Proceedings, 1907, 803), to which its reputed medicinal value might be due. These experiments were made both on the raw drug and on the roasted drug, the latter being the form in which it is prepared for

use in the Malay states; but the results of the investigation were chiefly negative, no special constituent being discovered to which the reputed medicinal value of the drug might be attributed. No alkaloidal body appears to be contained in the drug, and only the faintest indications of a glucosidal body were observed. The most characteristic constituent is a green amorphous resin, soluble in alcohol and ether, which was isolated both from the raw and roasted drug. Besides tannin, and an amorphous body, probably a phlobaphene, an insignificant quantity of a blue-purple substance was obtained during the search for an alkaloid, but this blue-purple body was observed only in the first batch of drug operated on, and not again when operating on fresh portions.—Pharm. Journ., Jan. 18, 1908, 52-54.

#### SALICARIÆ.

*Lawsonia Alba, Lamk.*—*Constituents of the Seeds.*—David Hooper describes the seeds of the "henna" plant *Lawsonia alba*, Lamk., known as *mehndi* throughout India, where it is found wild or cultivated. The seeds are contained in a capsule of the size of a peppercorn, and consist of angular grains of a cinnamon-brown color, with no pronounced taste or smell, and are quite small, 100 weighing only 0.073 Gm. (= 1.126 grains). They were found on analysis to contain: Moisture, 10.60; oil (by ether), 10.48; albuminoids, 5.00; carbohydrates, 33.62; fiber, 35.55; ash, 4.75 per cent. The oil is thick, dark green, and slowly oxidizes to a solid jelly; solidifies at 25.5° C.; has slight acid reaction. The iodine value of the crude oil was 121.63, and of the fatty acids 127.45. The seeds contain some tannic acid.—Pharm. Journ., June 13, 1908, 781; from Journ. and Proc. Asiatic Soc. of Bengal, 1908, No. 2.

#### ROSACEÆ.

*Bitter Almonds*—*Effect of Heat on the Amygdalin and Emulsin.*—G. Velardi finds that when heated to 103° C., bitter almonds are still capable of splitting off hydrocyanic acid. If the temperature was raised to 150° C., hydrocyanic acid was only then still developed, if the bitter almonds were mixed with a paste of sweet almonds containing emulsin. Therefore, while emulsin had become inefficacious at some point above 103° C., amygdalin had not been attacked up to 150° C. But when heated above that temperature, the amygdalin yielded in the presence of emulsin a constantly decreasing quantity of hydrocyanic acid; at 166° C., the hydrocyanic reaction only occurred after 12 hours, and towards 170° C., amygdalin was apparently changed.

*Pure Amygdalin*, when heated rapidly, melts with decomposition at 208° C.; when heated slowly up to 170°, it remains unchanged, but at 180° C., it becomes brown, forming a resinous mass which, however, still yielded with emulsin hydrocyanic acid.—Schimmel's Rep., Oct., 1907, 11; from Boll. Chim. Farm.

*Cerasus Padus Delarb.*—Amygdonitril-glucoside a natural constituent of the plant. See glucosides under "Organic Chemistry."

*Cotoneaster Microphylla*, Wall.—*Prulaurasin the Cyanogenetic Constituent of the Leaves.*—By extracting the fresh leaves and twigs of *Cotoneaster microphylla*, Wall, in the same manner as described for the preparation of "prulaurasin" (which see under "Organic Chemistry"), H. Hérissé obtained a crystalline cyanogenetic glucoside, which proved to be identical in all respects with the prulaurasin obtained by the author from cherry laurel leaves. Heretofore it has been demonstrated that the crystallized cyanogenetic glucosides isolated from the seeds of any *Rosacea* could invariably be identified with amygdalin; but, on the other hand, the vegetable portion of rosaceous plants had not heretofore yielded well-defined and crystallized products. The author has, however, now demonstrated the existence of a crystalline and definite cyanogenetic glucoside, different from amygdalin, in the vegetable portion of two plants of the *Rosacea*, namely *Prunus lauracerasus* and *Cotoneaster microphylla*, both containing "prulaurasin."—Arch. d. Pharm., 245 (1907), No. 6, 473-474.

*Eriobotrya Japonica*—*Cyanogenetic Glucoside of the Seeds.*—In 1885 Lehmann obtained from the seeds of the Japanese medlar (*Eriobotrya japonica*) a cyanogenetic glucoside, which he believed to differ from amygdalin, and to be a crystalline body, having the same constitution as that of the amorphous glucoside from cherry laurel leaves, to which he had given the name "laurocerasin." H. Hérissé has now succeeded in isolating from the seeds of this plant a well-crystallized glucoside, which proved to be identical in every respect with amygdalin. It was obtained by a process which is practically identical with that he employed for preparing "prulaurasin" (which see under "Organic Chemistry") from cherry laurel leaves. The possibility that a second cyanogenetic glucoside might be present in the seeds of Japanese medlar fruits, led the author to extend his investigations in this direction, by subjecting the extract of *eriobotrya* seeds to the action of emulsin after the method of Em. Bourquelot, and he determined that the difference in the polarimetric deflection caused by the action of the ferment was precisely the same as that ascertained by calculation under the assumption that the glucoside in question was amygdalin. A second cyanogenetic glucoside is therefore not present in the seeds of *Eriobotrya japonica* (see also Proceedings, 1886, 455). The author, furthermore, digested the fresh leaves of this plant to the action of water at 21° C. during 22 hours, and subjected the mixture to distillation. Neither the distillate, nor the residue in the still, when treated with emulsin in the usual manner, yielded hydrocyanic acid, nor could such be detected in the solution of an alcoholic extract of the leaves similarly treated.—Arch. d. Pharm., 245 (1907), No. 6, 469-472.

*Rubus Chamaemorus*, L.—*Medicinal and Economic Uses of the Fruit.*—

Having received from Newfoundland some ripe fruits of *Rubus chamaemorus*, L., known in that colony under the name of "bake apples," Mr. E. M. Holmes gives some interesting information concerning the uses of these fruits in the northern countries, where the plant flourishes in marshy and mossy soil. The fruits resemble blackberries in shape and size, but are yellow when ripe. In Scotland they are known as the "cloud berry;" in Russia they are known as "Moroshka," and are valued as a household diuretic in dropsy, scurvy, etc. In Norway and Sweden the berries are collected and sent to Stockholm, where they are esteemed both as a food and as a medicinal remedy. It has recently also been suggested that the high amber or orange-yellow color of the juice lends itself to impart color to wines, such as sherry or tokay, and that this coloring matter might be sought for by the analyst in the examination of light wines.—Pharm. Journ., Nov. 16, 1907, 639.

#### LEGUMINOSÆ.

*Balsam of Peru—Test for Distinguishing Genuine from Artificial Balsam.*—K. Dieterich recommends the following test for distinguishing genuine balsam of Peru from the artificial—the so-called "Perugen:" The sample is dissolved in ether, a layer of concentrated sulphuric acid is introduced, followed very carefully by a little hydrochloric acid. In the case of "Perugen" a red lower and a very characteristic green upper zone is formed, the intermediate layer of hydrochloric acid remaining colorless, whilst with genuine balsam both the upper and nether zone assumes a red color. The reaction depends on the presence of balsam of tolu in the so-called synthetic balsam of Peru, and is available also for the determination of balsam of tolu in the natural balsam of Peru.—Pharm. Ztg., liii (1908), No. 28, 279; from Ber. d. D. Pharm. Ges., 1908, No. 3.

*Castor Oil and Benne Oil.—Contamination with Zinc.*—W. v. Rijn calls attention to a contamination of castor oil and benne oil in the Dutch market, evidently derived from the zinc-iron containers. His experiments following the observation have demonstrated that metallic zinc dissolves in the oils named with comparative ease, a behavior which significantly points out the avoidance of such metallic containers for the storage of oils, which, like castor oil, are employed in medicine internally. He finds, however, that the zinc oleate dissolved in warm castor oil separates at the ordinary temperature in form of a fine, micro-crystalline, white precipitate, which may be removed by filtration. At all events, it is advisable that castor oil be stored in glass containers, and, if not perfectly clear, should be filtered.—Pharm. Ztg., lii (1908), No. 28, 279; from Pharm. Weekbl., 1908, No. 13.

*Synthetic Balsam of Peru—Distinctions from the Natural Product.*—Caesar & Loretz (Herbsbericht, 1907) observe that, although the so-called

synthetic balsam of Peru corresponds fairly well with the G. P. requirements, regarding specific gravity, acid- and saponification-numbers, and cinnamein content; the relative proportions of these numbers among each other vary from the numbers of the pure natural balsam, and the "nitric acid test" uniformly fails when applied to the synthetic product or its mixtures with the natural balsam. Moreover, the characteristic odor and taste of the natural balsam is completely absent in the artificial.—Pharm. Ztg., lii (1907), No. 74, 778.

In a lengthy rejoinder to the above restrictions on "synthetic balsam of Peru," Dr. F. Evers calls attention to the fact that, inasmuch as the synthetic balsam is recommended and supplied as an artificial product, the question of its utility as a substitute for the natural product does not hinge upon unimportant differences, such as the nitric acid reaction, taste and odor, etc., but upon its therapeutic equivalence when used as a substitute. As such it has been pronounced by competent authorities—physicians and veterinarians—not only the equivalent of the natural balsam, but in some respects superior.—Ibid, No. 79, 828–829.

*Copaiba—New Test for Gurjun Balsam.*—Charles E. Vanderkleed and H. W. Lynch speak commendably of the modification effected in the nitric-acetic acid test of the U. S. P. for the detection of gurjun balsam in copaiba, which consists in the reduction of the quantity of nitric acid from 4 drops, formerly directed to 1 drop, and increasing the quantity of glacial acetic acid from 1 Cc. to 3 Cc. This modified test closely approximates to the one proposed by Dodge & Alcott (see Proceedings, 1896, 628), and is free from the objection to the older test that the red or purple color characteristic of the presence of gurjun balsam is obscured by the dark coloration imparted to pure copaiba by the more concentrated nitric-acetic acid. Nevertheless, even the modified test is deficient in delicacy, owing to the slowness with which the color-reaction is developed: although by a further modification in the manipulation described by the author, it may become available for the detection of 5 per cent. gurjun balsam or over. An entirely new test has, however, been worked out by Mr. Jos. L. Turner, of the same laboratory, which depends upon the fact that when, to a solution of copaiba in glacial acetic acid, a dilute solution of sodium nitrite is added, and the mixture is poured onto concentrated sulphuric acid so as to form an upper layer, the acetic acid layer remains colorless, or at most colored only yellow; on the other hand gurjun balsam produces a dark violet coloration. The violet color is obtained in a few minutes with a mixture containing as little as 5 per cent. of gurjun balsam in copaiba, the yellow color of the upper layer rapidly passing through red into a distinct violet. The test is applied as follows: 3 or 4 drops of the balsam are dissolved in 3 Cc. of glacial acetic acid, one drop of freshly prepared 10 per cent. solution of sodium nitrite is added, and the mixture very carefully poured upon the surface of 2 Cc. of concentrated sulphuric acid in a

test-tube. Pure copaiba, if quite old, may give a dark-colored precipitate at the contact zone, but no violet color will appear in the clear upper layer, even on long standing, unless gurjun balsam is present.—Proc. Pa. Pharm. Assoc., 1907, 105-107.

In connection with the preceding abstract, a review of the different tests for gurjun balsam in copaiba by Mr. Vanderkleed will prove interesting. With regard to the new test of Turner, he now observes that *a dark color will always appear at the surface of contact*, but in the presence of *2 per cent. or more* of gurjun balsam a violet color appears in the clear upper layer. Introducing his subject, the author mentions that copaiba continues to be extensively adulterated with gurjun balsam, probably because the adulterators have rested secure in the knowledge that the methods for its detection in copaiba have not been satisfactory and could not be depended upon to give accurate results.—Amer. Journ. Pharm., Jan., 1908, 11-15.

*Copaiba—Possible Adulteration with "Hardwickia Balsam."*—Ernest J. Parry observes that it is an open secret that copaiba is adulterated to an enormous extent. In this practice advantage is being taken of analytical figures which are occasionally given by genuine copaiba so as to produce factitious mixtures which approximate in their analytical figures as nearly as possible to those of the genuine drug. Thus, the B. P. limits the optical rotation of the volatile oil from genuine (Maracaibo) copaiba from  $-14^{\circ}$  to  $17^{\circ} 30'$ , but from time to time samples of genuine copaiba yield oils with rotations of  $-25^{\circ}$ , and sometimes even higher; at others, though rarely, as low as  $-9^{\circ}$ . One of the objects of these limits is to exclude African copaiba, which yields oils of low laevo-rotatory power, but this is compensated by the addition of gurjun balsam, which has a high laevo rotation, and it is an almost positive certainty that many samples of copaiba were sophisticated with African copaiba in this way. Fortunately the presence of gurjun balsam can be detected with ease, and this adulterant has become impossible. The author in this connection draws attention to the possible use of the balsam known as Hardwickia balsam, which has been described by Weigel, Hooper and Schimmel (see Proceedings, 1907, 808-809), and he tabulates the figures obtained by them as follows:

	Weigel.	Hooper.	Schimmel.
Specific gravity.....	0.977	1.0124 to 1.0068	1.0021
Acid number .....	73.28	97.2 to 99.8	96.2
Ester number .....	9.66	9.0 to 12.6	12.3
Essential oil .....	48.5 per cent.	41.1 to 39.5 per cent.	44 per cent.



Weigel found that the essential oil had a specific gravity 0.9045, and optical rotation  $-8^{\circ} 24'$ .—Chem. & Drugg., Sept. 28, 1907, 518.

*Hardwickia Balsam*.—*Botanical Sources, etc.*—Hans Solereder directs attention to the fact that the plant yielding the so-called "hardwickia balsam," formerly designated *Hardwickia pinnata*, Roxb., is now botanically designated as *Kingiodendron pinnatum*, Harms, and belongs to a genus which is distinct from that of *Hardwickia*. The only remaining member of the genus *Hardwickia* is *H. binata*, Roxb., but this, as pointed out by Hooper, does not yield a balsam. The principal object of the author's investigation, however, is the determination of the seat of the balsam of *Kingiodendron pinnatum* in the plant; whether, as in the case of guaiacum, it constitutes a filling mass in the lumina of the vessels or other wood-elements, or, like in the *copaifera*, as seemed more likely, it has its source in secretory-passages of the wood. Incidentally, also, the investigation was extended to plants of allied genera, such as *Oxystigma*, *Priosia*, *Copaifera* and *Detarium*, with the result that with the exception of *Hardwickia* and *Detarium*, which do not yield a copaiba-like balsam, the members of the various genera are provided with secretory-passages in the wood, from which the balsam is derived as in the case of *Kingiodendron*.—Arch. d. Pharm., 246 (1908), No. 1, 71-77.

*Segura Balsam?*—*A Possible Adulterant for Copaiba*.—Utz calls attention to "segura balsam," a commercial product of unknown origin, which he has reason to believe is now used in admixture with gurma balsam as an adulterant of copaiba. He describes it as a dark brown, viscous mass, which becomes thin-liquid on heating, having an agreeable aromatic odor. It is only partly soluble in alcohol, but completely soluble in chloroform, benzene, petroleum ether, and carbon tetrachloride. Subjected to distillation it yielded 5 per cent. of water and 30 to 40 per cent. of a volatile oil, having the sp. gr. 0.9451 at  $15^{\circ}$  C.;  $n_D^{19}$ — $19^{\circ}$  C.;  $n_D^{150}$ , 1.4992. The author believes that this oil, either by itself, or in admixture with some of the original segura balsam, is likely to be used in future as an adulterant of copaiba.—Pharm. Centralh., xlix (1908), No. 1, 16.

*Asiatic Licorice Root—Superior Quality*.—S. G. Kowalew calls attention to the licorice root collected in large quantities in Siberia, Turkestan and Mongolia, from

*Glycyrrhiza Uralensis*. It is a distinct commercial variety of the drug, which is known by the name of "Chuntschir," and is superior to the best Spanish, and scarcely inferior to the best Russian licorice roots. The roots collected in the autumn contain more glycyrrhizin than those collected during summer, and will float upon water, while the summer-drug will sink in it.—Pharm. Ztg., lii (1907), No. 98, 1022; from Chem. Ztg., 1907, Rep., 87.

*Gum Tragacanth and Gum Arabic—Commercial Sorts*.—Dr. H. Kühl

gives a brief description of a number of commercial sorts of gum tragacanth and gum arabic which have come under his observation, namely: Gum tragacanth from India; from Syria; from Anatolia. Gum arabic from Asia (Persia); from North Africa (Kordofan, to the west of the Nile); from South Africa (river region of the Senegal); from South America (Brazil).

*Persian Gum Arabic* is insoluble, and of course not useful for pharmaceutical purposes. It yielded 3.5 per cent. of ash, and contained 19.2 per cent. moisture.

*Kordofan Gum Arabic* is very soluble, yields 3.75 per cent. ash and 13.25 per cent. moisture.

*Senegal Gum Arabic* is readily soluble and very suitable for pharmaceutical purposes.

*Brazilian Gum Arabic* is also very readily soluble, but it has a deep ruby-red color. It yields 3.75 per cent. ash, and 14.5 per cent. moisture.

*East African Gum Arabic* is sparingly soluble and possesses little adhesiveness.—Pharm. Ztg., liii (1908), No. 25, 251.

#### TEREBINTHACEÆ.

*Canarium Commune*.—*Yield and Characters of the Fat from the Seeds*.—P. Pastrovich has extracted from the seeds of *Canarium Commune*, which are known in the Dutch East Indies as "Java almonds" and used as food, up to 65 per cent. of a fat by means of petroleum ether, and obtained 56 per cent. by simple expression. This fat is a light yellow, odorless oil, having an agreeable taste, and may prove valuable as a food product. It congeals at 17° C., and separates on prolonged standing globular aggregations of solid components. It melts in a capillary tube at 18° C., forming an opalescent fluid, which does not become clear before the temperature of 28° C. is reached. It does not give either Halphen's or Baudouin's reactions.—Pharm. Ztg., lii (1907), No. 66, 689; from Chem. Ztg., 1907, No. 63.

*Elemi*.—*New Reactions*.—It is usually assumed the elemi is a product derived from certain species of *canarium* in the East Indies, and from species of *Itnico* (*Itica*) in South America; but the precise source is still obscure, and this uncertainty renders the drug particularly susceptible to adulteration. Paul Stoepel remarks that for this purpose the balsamic exudations of the different *coniferae* lend themselves admirably, turpentine for example imparting to dried-up elemi the soft consistence which is expected in a good article. The identity of a sample is however easily determined if, besides the well-known morphological characters, the elemi will respond to the following new test: Heated in a water-bath, elemi melts to form a clear, yellowish-green liquid, which assumes a handsome eosin-red color on the addition of diluted sulphuric acid (1:4). Adultera-

tions with turpentine are detected by the following test, which is also new : The elemi is dissolved in absolute alcohol in the proportion of 1:10. Genuine elemi produces a solution which is neutral to litmus, whereas turpentine, if present, reddens blue litmus paper. If the solution is then diluted with water, a pure white, milky turbidity (emulsion) results, while the presence of turpentine is revealed by the deposition of resinous, brownish-yellow flakes.—Apoth. Ztg., xxiii (1908), No. 49, 440.

*Manila Elemi*.—Source and Characters; Examination of Volatile Oil from Different Samples.—Clover has collected and examined 21 different samples of Manila elemi which, he states, is chiefly derived from *Canarium luzonicum*, a tree called "*pili*" in the native language, while the resin has the Spanish name "brea." The manner of producing the resin resembles that of turpentine. The commercial elemi is in the fresh state soft, sticky, and non-transparent, has a pleasant odor, and a spicy, somewhat bitter taste. It dissolves readily in ether, chloroform, and benzene—all but small quantities of water and a granular substance; in the other usual solvents, only if large quantities of solvents are used—about 25 per cent. of a white crystalline residue remaining if a small quantity of alcohol is employed. From fresh elemi bought at Manila, the yield of oil—by steam distillation in the usual manner, followed by distillation *in vacuo* towards the end of the process, to drive off the last portions of oil—often amounts to 25–30 per cent. The oils thus obtained from the 21 samples showed considerable differences in the constants and composition. Ten of the oils consisted of pure *d-limonene*. Nine others contained a greater or smaller proportion of *phellandrene*, and with one exception were more or less strongly dextrorotatory. The exception was a levorotatory oil which contained chiefly *l-limonene*; three of the oils contained in addition to phellandrene a lower boiling terpene, probably *pinene* or an allied terpene, and three of the strongly dextrorotatory oils appeared to consist of pure phellandrene. Finally, two elemi oils—designated "oils 20 and 21"—both rotated  $+4^{\circ}$  to the right, and were found to consist of almost pure *terpinene* and *terpinolene* respectively. The details of these interesting investigations are given in abstract, in Schimmel's Rep., Oct., 1907, 37–40; from Philippine Journ. of Sc., 2 (1907), A. 1.

*Herrabol Myrrh*.—Chemical Investigation.—O. v. Friedrichs reports the results of a comprehensive inquiry into the chemistry of herrabol myrrh, from which it appears that this drug contains as essential constituents: a volatile oil, several resins, a gum and an enzyme, but no characteristic bitter principle such as may occur in myrrh has been isolated, and is apparently absent.

*The Volatile Oil* (obtained to the amount of 8.8 per cent.) contained: Free formic and acetic acids; a monobasic acid ( $C_{17}H_{22}O_8$ ) which has been named "myrrholic acid;" m-cresol (in appreciable quantities);

cuminol, cinnamic acid, and a new sesquiterpen, which has been named "herrabolen."

*The Resins* consisted of a portion soluble in petroleum ether, a second soluble in ether but insoluble in petroleum ether, and a portion insoluble in ether. The petroleum ether-soluble portion yielded acetic acid on dry distillation. The portion soluble in ether but insoluble in petroleum ether contained three free acids: " $\alpha$ - and  $\beta$ -commiphoric acid" ( $C_{14}H_{18}O_4$ ), and " $\gamma$ -commiphoric acid" ( $C_{17}H_{22}O_5$ ); on saponification it yielded a monobasic acid, "commiphoric acid," having the formula  $C_{26}H_{36}O_8$ ; it also contained two phenols: " $\alpha$ -herrabo-myrrhol" ( $C_{18}H_{26}O_5$ ) and " $\beta$ -herrabo-myrrhol" ( $C_{20}H_{28}O_6$ ). An alcohol of the formula  $C_{14}H_{22}O_2$  was liberated during the saponification of this resin and volatilized with the water-vapor. The resin, "herraboresen" ( $C_{42}H_{56}O_8$ ) contains a methoxyl group. The portion of resin insoluble in ether consisted of two acids: " $\alpha$ -herrabo-myrrhololic acid" ( $C_{15}H_{22}O_7$ ), and " $\beta$ -herrabo-myrrhololic acid" ( $C_{25}H_{32}O_8$ ).

*The Gum* apparently contained galactose and arabinose, and was associated with an *enzyme* belonging to the oxydases.—Arch. d. Pharm., 245 (1907), No. 6, 427-457.

*Myrrh—Characterization of the Gum.*—Referring to the work of von Friedrichs on "Herrabol Myrrh" (which see), B. Tollens calls attention to a study of the gum of myrrh made by Dr. Hauer and himself in 1903 (Ber. d. d. Chem. Ges., 36, 3312), with results that were more positive and far-reaching than those obtained by von Friedrichs. They had determined among the products of the hydrolysis of the gum, not presumably, but *with certainty*, the presence of *galactose*, *xylose* and *arabinose*; the first two being isolated in substance, while arabinose was obtained in the form of benzyl-phenyl-hydrazone.—Arch. d. Pharm., 246 (1908), No. 1, 70.

*Poison Sumac* (*Rhus vernix*, Linne, *R. venenata*, De C.) is the title of a joint study by A. B. Stevens and L. E. Warren, in which they describe the chemical constituents of the juice, fruit and resin, with particular regard for the poisonous constituent of the plant, in "Proceedings," 1907, 419-443.

*Poison Ivy Fruit—Presence of Poison in the Green Fruit Only.*—In their paper on "Poison Sumach" (Proceedings, 1907, 423-443), A. B. Stevens and L. E. Warren referred to Pfaff's statement that he found the poison in the fruit of the poison ivy and poison sumach, and declared their belief that he must have employed fruit collected in the green state, as they had repeatedly examined the ripe fruit of both species, and each time were unable to find poison. Mr. Stevens says that since writing this paper they have examined two samples of mature but unripe fruit of poison ivy and both were poisonous.—Amer. Journ. Pharm., Febr., 1908, 93.

*Rhus Succedanea*—*Localization of the Fat in the Fruits*.—S. Tabata has made a micro-chemical examination of the fruits of *Rhus succedanea*, which are the source of the fatty substance known commercially as Japan wax. This fat is found in all parts of the fruit, but only assumes a waxy consistence in the mesocarp. The micro-chemical examination of the substances found shows that before germination of the seeds the cotyledons contain fat, magnesia and protein in considerable quantity, but no starch; starch, however, is formed during the germination at the expense of these substances.—Pharm. Journ., Febr. 15, 1908, 191; from Journ. of the College of Science, Tokio, vol. 23, art. 1.

#### PIPERACEÆ.

*Black Pepper*—*Microscopical and Chemical Examination*.—Henry Kraemer and Harry E. Sindall publish the results of a microscopical and chemical examination of the commercial varieties of black pepper, illustrated with cuts showing the most characteristic microscopic features. One of the first observations made on the examination of cross-sections of pepper corns is that the margin varies markedly in outline in the different commercial varieties, and it would appear that the different varieties may in a measure be distinguished by their character. Moreover, there is a considerable difference in the structure of the pepper corns from different sources. In Aleppi, Telicherry, and Singapore peppers there is a sub-epidermal pigment layer, which is almost wanting in Lampong pepper. The lumen of the stone cells of the epicarp have very little pigment in Aleppi pepper, whereas in Lampong pepper the lumen of these cells contain a dark-brown pigment, while in the other varieties it is lighter in color. The stone cells of the epicarp vary both in compactness of arrangement and in shape; they also show a tendency to develop in certain directions, varying from nearly isodiametric or palisade-like cells, to long tapering, or somewhat shoe-shaped. The parenchyma cells beneath, and associated with, the stone cells in some varieties resemble ordinary parenchyma cells, while in others they are more or less collapsed, causing the oleo-resin cells to stand out rather prominently. The lumen of the stone cells of the endocarp are quite different in different peppers; those in Bengal and Singapore pepper having a reddish-brown content, which is almost wanting in the other varieties. In addition the walls of these cells are variously thickened. The oil cells above the stone cells of the endocarp are large and very distinct in Aleppi, Acheen and Singapore pepper but much less developed in Lampong pepper. The chemical examination (of Lampong peppers and commercial ground peppers) was made by the methods of analysis given by Leach and adopted by the Association of Official Agricultural Chemists, the only deviation made being in the determination of starch, which was by Allihu's original method for the determination of dextrose. The results may be consulted in Amer. Jour. Phar., Jan., 1908, 1-11.

*Ground Black Pepper—Estimation of Quality.*—F. Härtel suggests that the quality of ground black pepper is most conveniently estimated on the basis of the starch content and, incidentally, of the cellulose. The starch is converted by the diastase method of Raumer into sugar, the sugar is inverted by boiling with hydrochloric acid, and then determined as glucose in the usual way, the amount so determined being calculated as the "glucose value." He finds the "glucose value" of normal black pepper to be 36 to 40 per cent. on the average, sinking in the inferior grades to 31 per cent., whilst the best sorts may reach 42 per cent. In the hulls this value amounts to 2.12 per cent., and in the refuse (chaff), from the preparation of white pepper, it ranges from 7.95 to 23.7 per cent. (average 14 per cent.). Pepper should therefore show a "glucose value" of at least 30 per cent. The content of crude fiber (cellulose) fluctuates in normal black pepper from 11 to 16 per cent.; the poorer sorts contain up to 17 per cent., whilst the hulls and chaff contain from 19 to 30 per cent. The mineral matter and sand present in a sample do not afford a reliable criterion for the presence of added hulls or chaff. The determinations of piperin, tannin, coloring matter, etc., are too circumstantial to come into practical consideration.—Schweiz. Wschr. für Ch. u. Pharm., xlv (1907), No. 30, 454; from Ztschr. f. U. d. N. u. G., 1907, No. 11, 666–675.

*Piper Methysticum—Chemical Investigation.*—In continuation of previous investigations of the chemical constituents of Kava-kava root, conducted by the chemists of J. D. Riedel & Co. (see Proceedings, 1904, 734), the results of the more recent investigations are included in the following summary published in the report of that firm of 1908: Kava root contains, besides the usual inorganic salts and vegetable constituents, resin, 5.3 per cent.; methysticin, 0.3 per cent.;  $\psi$ -methysticin, 0.268 per cent.; yangonin, 0.184 per cent.; alkaloid, 0.022 per cent.; two glucosides, 0.69 per cent.; also free sugar and amorphous acids, insoluble in water, 0.7 to 0.8 per cent. The mixture of resins contains 23 per cent. of resin acids and 77 per cent. of resin esters. The portion of the resins soluble in petroleum-ether contains more or less of solid crystalline resin esters. Yangonin, methysticin, and  $\psi$ -methysticin are obtained from the crystalline mixture obtained from the alcohol extract by fractional crystallization from acetone. Methysticin is, as stated by Pommeranz, a  $\beta$ -ketonic acid ester, and contains a piperinic acid residue; the methysticol obtained from this is identical with the piperonylenacetone synthesized by Stolz.  $\psi$ -methysticin is also an ester of methysticinic acid. Yangonin is a lactone of the formula  $C_{15}H_{14}O_4$ .—Apoth. Ztg., xxiii (1908), No. 37, 335.

#### RHAMNACEÆ.

*Bitterless Cascara—Effect of Magnesia not Detrimental.*—The opinion expressed by Panchaud that the use of calcined magnesia for rendering

cascara bark bitterless is detrimental to its activity (see Proceedings, 1906, 628), because the oxymethylantraquinone is rendered insoluble by its action, is contradicted by the observation and experience of Cæsar and Loretz (Herbstbericht, 1907), since it has been shown that fluid-extracts prepared from cascara bark, which had been made bitterless by means of magnesia, were rapidly and reliably active.—Pharm. Ztg., lii (1907), No. 74, 778.

#### CELASTRACEÆ.

*Celastrus Scandens*.—*Proximate Examination of the Fruits*.—The fruit of the climbing bittersweet, *Celastrus scandens*, gathered near Mount Vernon, Iowa, was subjected to proximate chemical examination, and the following constituents were determined by A. A. Wells and Grant S. Reeder: Sugar (fructose); tartaric, gallic and oxalic acid (the latter as calcium oxalate); a yellow coloring matter (fisetin); a chocolate-brown resinous body, and, in the seeds, two fixed oils, the one lemon-yellow, soluble in alcohol, the other orange-yellow, and insoluble in alcohol. Both oils contained olein and palmitin, but in different proportions, the first consisting principally of olein, while in the orange-yellow oil palmitin predominated.—Chem. News, Oct. 25, 1907, 199.

#### EUPHORBIACEÆ.

*Caoutchouc*.—*Progress in Determining Available Plants in the German-African Colonies*.—Engler and Thoms report that *Landolphia owariensis* and *Ficus Vogelii* yield good to medium-good caoutchouc. The so-called "Karite-Gutta" was not recognized as being a substitute of full value for gutta-percha, but, containing 24 per cent. of caoutchouc-like components, it may serve for technical purposes. Theo. Loesner calls attention to several species of *Gymnosporia* in German East Africa, yielding caoutchouc. Among these, *G. amaniensis*, in particular, containing latex in the branch bark, leaves and petioles, is noteworthy. *G. bucobina*, which flourishes on the Victoria Nyanza, and *G. lepidota*, Loes., which is widely distributed in tropical Africa, also contain caoutchouc, but their utility for its collection remains for future determination.—Pharm. Ztg., liii (1908), No. 30, 300.

*Para Caoutchouc*.—*Presence and Characters of Protein Constituent*.—When Para caoutchouc is subjected to the action of solvents a very voluminous residue remains, the quantity depending on the nature of the solvent. It constitutes a jelly-like mass, the volume of which is in no definite proportion to the weight of solid substance contained in it. Previous investigators have assumed that this substance contains, besides the ash, only C, H and O. Spence has, however, recently investigated the characters of the substance remaining after repeatedly extracting Para caoutchouc with chloroform, and found it to contain nitrogen in variable

proportions (1.74 to 5.4 per cent.). The highest nitrogen value (5.4 per cent.), corresponding to 33.75 per cent. of protein, was obtained by repeatedly extracting a sample with chloroform during three months. The author regards the vegetable proteins present in this caoutchouc to differ in their chemical composition from the ordinary proteins. They are apparently more complicated, and resemble more nearly the glycoproteids. An element of uncertainty, however, due to the relatively small nitrogen content found in this substance, consists in the difficulty to completely extract the caoutchouc substance with solvents. The identity of the protein substance, which occurs in net-like layers, may be recognized in the microscopic sections of the caoutchouc prepared as described by the author.—Apoth. Ztg., xxiii (1908), No. 25, 239; from Gummizeitung, 1908, 662-666.

*India-Rubber—Synthetic Rubber vs. Substitutes.*—Herbert Wright points out that the synthetic rubber which has, from time to time, been reported as having appeared on the market, is a myth. "We can confidently state," says he, "that we never have seen a sample of synthetic rubber (the term used in the strict scientific sense), though time after time we have received samples of artificial rubbers and so-called rubber substitutes. Furthermore, we emphatically declare that we do not know of the production, on either a laboratory or commercial scale, of synthetic rubber." With regard to "rubber substitutes," it is quite a different matter. Everyone must know that natural rubber alone, though it is very tough, would be of little use if not compounded with various substances. Mixing is one of the most important branches of the rubber industry, and many developments may be expected in that direction. As a matter of fact, rubber substitutes are already largely employed in the manufacture of certain india-rubber articles, and large factories have long been established for their preparation. Vulcanized oils, the preparation of which is rendered possible on account of the action of sulphur chloride on various oils and fats, are largely used as rubber substitutes. In the manufacture of these substitutes, processes somewhat similar to those used in the vulcanization of india-rubber are carried out, hence the reason why they are described as vulcanized oils. Linseed, rape, poppy seed, cotton seed, castor, and numerous other oils are used in this way, as well as substances having a gummy and resinous texture. There has never been any attempt at secrecy in connection with the use of these substitutes, but yet we find that the announcement of a new one is received with great astonishment by people who ought to know that rubber would be of very little use if it were not mixed and compounded with various substances.—National Drugg., April, 1908, 113; from India-Rubber Journal.

*False Euphorbium—Composition.*—C. Leuchtenberger communicates in detail experiments made to determine the composition of a superior



euphorbium of unknown botanical origin, occurring in the Swiss market. It consists of irregular, whitish-gray pieces, resembling inferior, friable gutta-percha, and was found to have the following composition: Pseudo-euphorbic acid, soluble in ammonium carbonate, 1 per cent.;  $\alpha$ -pseudo-euphorbic acid, yielding an insoluble lead-salt, 10 per cent.;  $\beta$ -pseudo-euphorbic acid, yielding a soluble lead-salt, 9 per cent.; pseudoeuphorbon, a crystalline resin, having the formula  $C_{15}H_{14}O$ , 25 per cent.; pseudoeuphorboresin, 20 per cent.; volatile oil, 0.2 per cent.; salts of malic acid (mainly calcium salt), 25 per cent.; carbohydrates, 3 per cent. The crystalline pseudoeuphorbon appears to be closely related to the euphorbon of genuine euphorbium.—Arch. d. Pharm., 245 (1907), No. 9, 690-700.

*Kalvo Nuts—Poisonous Properties.*—Attention having been directed to some poisonous nuts from South America, sold on the streets of London as "kalvo nuts," which had caused symptoms of poisoning in five children who had eaten them, samples of these nuts were forwarded to the Museum of the Br. Phar. Soc., and have been identified by E. M. Holmes as being the seeds of

*Aleurites Fordii*, Hemsley, a species that has only recently been described as being the true source of the now widely known "tung oil" or wood oil of China, heretofore supposed to be derived chiefly from *Aleurites* (*Elæococca*) *cordata*, A. Juss. The seeds are somewhat triangular in outline, with rounded edges, averaging an inch long,  $\frac{3}{4}$  inch broad, and  $\frac{1}{2}$  inch in thickness, convex on one side, and more or less sloping on the other to a central ridge. In many seeds, however, the central ridge, which gives the slightly triangular character to the seed, is depressed, so that the seed is almost plano-convex; at the apex of the seed there is a small, triangular, spongy brown strophiole or caruncle. The outer surface is faintly striated on the convex side, and is more or less covered with the remains of a whitish epidermis. The shell is about  $\frac{1}{4}$  of an inch in thickness and the kernel is white, with two thin leafy cotyledons visible in its slightly hollow center. It has a slightly acrid taste. The whole of the surface is, more or less, covered with small projecting points, some of which unite to form short ridges. This feature, their smaller size, and the relatively thin shell distinguish them from the seeds of *Aleurites cordata*, in which the shell is much harder, twice the thickness, and has several longitudinal depressions.—Pharm. Journ., Aug. 10 and 17, 1907, pp. 231 and 241.

#### URTICACEÆ.

*Cannabis Americana* (*Cannabis Sativa*) has been subjected to a pharmacological study by E. M. Houghton and H. C. Hamilton, who report the results in a paper to this Association, in "Proceedings," 1907, 445-448.

*Elm Tree Galls—Presence of a New Carbohydrate.*—The elm tree (*Ulmus campestris*) is sometimes affected with galls, often as large as or larger than an orange, which have been the subject of chemical investigation by N. Fasserini. When fresh these galls contain a tasteless, slightly colored, syrupy liquid, which filters with difficulty. When precipitated with alcohol, this throws out a carbohydrate having the empirical formula  $C_6H_{10}O_5$ , and the  $\alpha_D + 191.8^\circ$ . It does not reduce Fehling's solution, but does so after hydrolysis with dilute mineral acids. The reducing sugar formed has not been identified. This body is supposed to be allied to the dextrins.—Pharm. Journ., Oct. 5, 1907, 435; from Gazz. Chim. Ital., 37 (1907) 387.

#### CONIFERÆ.

*Pinus Jeffreyi, Murr.—Composition of the Resin.*—C. Leuchtenberger has determined the following constituents in the resin of the "Nut Pine" or "Digger Pine," formerly designated botanically as *Pinus sabiniana*, but now determined by Lemmon as being *Pinus Jeffreyi*, Murr.: The resin occurs in the form of brown, glassy, irregular pieces, very brittle, and readily reduced to a yellowish-white powder. It is deprived of the greater part of the volatile oil (a heptane) with which it is naturally associated, but retains a strong orange-like odor, and a similar but rather faint taste. It is comparatively free from impurities, and is soluble in alcohol, ether, benzene, chloroform, acetone, methylalcohol, pyridine, petroleum ether, toluene, carbon disulphide, carbon tetrachloride, and glacial acetic acid. Besides 0.6 per cent. of volatile oil and 10.4 per cent. of a neutral resin, it contains four resin acids, viz.:

1. Soluble in ammonium carbonate:  $\alpha$ -Jeffropinic acid, forming a lead salt insoluble in alcohol, 4.0 per cent.;  $\beta$ -Jeffropinic acid, forming a lead salt soluble in alcohol, 9.0 per cent.

2. Soluble in sodium carbonate:  $\alpha$ -Jeffropinolic acid, forming a lead salt insoluble in alcohol, 35.0 per cent.;  $\beta$ -Jeffropinolic acid, forming a lead salt soluble in alcohol, 38.2 per cent.—Arch. d. Pharm., 245 (1907), No. 9, 701-707.

*Pinus Sabiniana—Chemical Examination of Oleoresin.*—Frank Rabak has made a chemical investigation of the oleoresin of the "Digger Pine" (*Pinus sabiniana*). The sample under examination was obtained from Oreville, Cal. It was semi-solid, dirty-brown in color, contaminated with bits of bark and other extraneous matter and had a pronounced, peculiar but agreeable odor. Its chemical constants were determined to be as follows: Acid number, 127; ester number, 37; saponification number, 164. It yielded to steam distillation 7.3 per cent. of a practically colorless volatile oil, decidedly mobile, which, having a peculiarly pleasant orange-like odor, was assumed to be "abietene." A small fraction of yellowish oil, lacking the pleasant odor, and of higher sp. gr. (0.810 at

23° C.), was obtained toward the end of the distillation. The first distillate had the sp. gr. 0.677 at 23° C., was optically inactive, soluble in 3 parts of 95 per cent. alcohol, only slightly soluble in 50 per cent. alcohol, in 1 p. chloroform, and in 40 p. concentrated solution of sodium salicylate. The odorous principle of the oil was obtained by suitable treatment described. It consisted of a small quantity of yellowish oil, having the agreeable odor in a highly concentrated condition, and leaving the bulk of the original oil practically odorless. The acid number of this odorous fraction was 42; ester number, 124; and saponification number, 166. It was optically inactive. The *resin* remaining after the distillation of the volatile oil, was hard, opaque, very brittle, and produced an optically inactive alcoholic solution. The acid number was 142.—Pharm. Rev., July, 1907, 212-215.

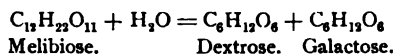
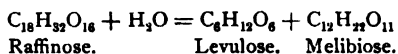
*Venice Turpentine—Detection of Ordinary Turpentine.*—L. E. Walbron recommends the following method for the detection of ordinary turpentine in Venice turpentine: 10 Gm. of the suspected turpentine is dissolved in 30 Gm. of ether, and the solution heated for ten minutes on a water-bath at a temperature of 20.5° C.; to this solution 8 Cc. of  $\frac{N}{2}$  solution of ammonia, which has previously been warmed to the same temperature is added, and the whole carefully shaken. If the sample is pure the liquid, after the lapse of eleven minutes, solidifies to a jelly. If ordinary turpentine be present, a longer time is required for solidification, according to the amount present; with 2 per cent. it will be 12.7 minutes; 6 per cent., 20 minutes; 10 per cent., 26.8 minutes.—Pharm. Journ., May 2, 1908, 572; from Ark. Pharm. u. Kemi., 15 (1908, 105; through Chem. Ztg., April 8, 1908.

*Thuja Plicata—Volatile Constituents of the Leaves and Wood.*—W. C. Basdale has obtained by steam distillation and examined a volatile oil from the leaves, and a crystalline body from the wood of *Thuja plicata*, a tree indigenous to the Pacific Coast of North America, forming dense forests in eastern Washington and Oregon, where it is known under the names "red cedar" and "canoe cedar." The *volatile oil of the leaves* had a terpene-like odor, and showed the following constants: Sp. gr., 0.8997 at 15° C.; opt. rot., +1° 45'; index of refract., 1.4575; b. p., 150° to 225° C. Apart from "thujone," which was isolated and identified, no constituents could be further identified. The *volatile crystalline body* from the chips of the wood was extracted from the aqueous distillate with ether. It formed white crystals, m. p., 80° C., having the characteristic pungent odor of the wood, and a molecular formula which is possibly expressed by  $C_{10}H_{16}O_2$ .—Schimmel's Rep., Oct., 1907, 91; from Journ. Amer. Chem. Soc., 29 (1907), 539.

*Taxineæ—Constituents of Different Plants Belonging to this Family.*—In connection with his studies and investigations, which have determined

the presence of a new glucoside, *taxikatin*, and of *raffinose*, (which see under "Organic Chemistry"), together with some *saccharose*, in the leaves and twigs of

*Taxus baccata*, L., Ch. Lefebvre has extended his investigations to the application of the biochemical method proposed by Em. Bourquelot for the determination of the kinds of sugar and the glucosides in coniferous plants belonging to the Taxineæ. According to Scheibler and Mittelmeier the hydrolysis of raffinose by means of acids is accomplished in two stages, viz. :



It was pointed out by these authors that invertin (yeast ferment) only accomplishes the first stage of the hydrolysis of raffinose, and that it is without further action upon the melibiose. This is confirmed by the investigation now undertaken by Lefebvre, who has moreover obtained results, when invertin alone was used, which might lead to the inference that saccharose is present in an extract if it were not known that raffinose alone is the sugar under examination. He finds further, that if the sugar solution, after treatment with invertin, is subjected to the action of emulsin, the hydrolytic action extends also to the melibiose, even if the invertin has first been destroyed by heat; but complete hydrolysis of the raffinose can not be effected, even by the combined action of invertin and emulsin, and the hydrolyzed solution must therefore contain 4 sugars, namely: melibiose, levulose, dextrose and galactose. The presence of raffinose thus forms an impediment to the biochemical determination of cane sugar in its presence, but this may be accomplished by other means, as pointed out in the author's paper above referred to. Besides raffinose and saccharose the leaves of *Taxus baccata* contain several lævogyre bodies which are not hydrolyzable by emulsin, and there is evidence also that several glucosides are present besides taxikatin. The young twigs are also shown to contain both invertin and emulsin. In the following, the author's investigations are confined mainly to the determination of the the saccharose and the glucosidal bodies, as also the recognition of invertin and emulsin in several other members of the Taxineæ, raffinose, if present, being included in the results as cane sugar.

(1) *Cephalotaxus drupacea*, Sieb. et Zucc.—100 Gm. of fresh leaves and twigs contain 0.83 Gm. pre-existing reducing sugar, 1.49 Gm. cane sugar, and a glucosidal body hydrolyzable by emulsin, and two ferments—the one, similar to invertin, splitting up cane sugar, the other, similar to emulsin, capable of hydrolyzing amygdalin and salicin.

(2) *Cephalotaxus pedunculata*, Sieb. et Zucc.—100 Gm. of the fresh young twigs contain 0.47 Gm. of pre-existing reducing sugar, 1.62 Gm. of cane sugar, a glucosidal body splitting up with emulsin, and both invertin- and emulsin-like ferments.

(3) *Podocarpus chinensis*, Swett.—100 Gm. of fresh young twigs contain 0.44 Gm. of pre-existing reducing sugar, 0.99 Gm. of cane sugar, together with a glucosidal body splitting up by the action of emulsin, and also invertin- and emulsin-like ferments.

(4) *Torreya myristica*, Hook.—100 Gm. of fresh young twigs contain 0.78 Gm. of pre existing reducing sugar, glucosidal bodies hydrolizable by emulsin, and the invertin-like and emulsin-like ferments that have been observed in the other plants.—Arch. d. Pharm., 245 (1907), No. 7, 493-502.

*West African Copals—Varieties, Solubilities and Constituents.*—H. Rackwitz reports the results of the chemical investigation of the West African copals, which, according to their source, are designated as Sierra Leon, Acora, Benin, Cameroon, Loango, Congo, Angola (red) and Benguela copal, respectively. In general, these copals are only partially soluble in alcohol, ether, chloroform, toluene, acetone, benzene, glacial acetic acid, acetic ether, and in 60 per cent. and 80 per cent. chloral hydrate. They are almost completely insoluble in petroleum ether, but, on the other hand, nearly perfectly soluble in alcohol-ether if they are preliminarily digested for a considerable time in ether. The author has determined the melting-points and the acid-, saponification- and iodine-numbers of these several varieties, and, in particular, the constituents of the Angola (red) and Cameroon copals, the latter being essentially as follows:

*Angola (red) Copal:* Angocopalic acid ( $C_{28}H_{38}O_4$ ), 69 per cent.;  $\alpha$ -angocopaloresen ( $C_{30}H_{34}O_4$ ), 3 per cent.;  $\beta$ -angocopaloresen ( $C_{28}H_{38}O_4$ , insoluble in ether, soluble in ether-alcohol), 20 per cent.; volatile oil (b. p. about  $153^\circ$  C.), 2 per cent.; bassorin-like-body, 0.3 per cent.; ash, 5.7 per cent. Soluble in ether, 69 per cent.; soluble in ether-alcohol, 25 per cent.; insoluble, 6 per cent.

*Cameroon Copal:* Cameroon copalic acid ( $C_{21}H_{30}O_3$ ), 70 per cent.;  $\alpha$ -Cameroon copaloresen (soluble in ether), 3 per cent.;  $\beta$ -Cameroon copaloresen ( $C_{25}H_{38}O_4$ , insoluble in ether, soluble in ether-alcohol), 20 per cent.; volatile oil, 2 per cent.; bassorin-like body, 3 per cent.; ash, 2 per cent. Soluble in ether, 75 per cent.; soluble in ether-alcohol, 20 per cent.; insoluble, 5 per cent.

The  $\beta$ -resens are shown to have the same composition as that previously described and determined by Tschirch and Stephan from Zanzibar copal, while the copalic acids are evidently closely related with the trachyolic acid of the latter, with which the Cameroon copalic acid is identical in composition.—Arch. d. Pharm., 245 (1907), No. 6, 415-426.

*African Copals—Chemical Investigation.*—A. Engel reports the results of a chemical investigation of two African copals, both belonging to the "copaibo-copals" of Tschirchs' system, the one designated as "Congo-copal" and the other as "Benguela-copal (white)."

*Congo-Copal* occurred in irregular, angular pieces of a light-yellowish to brown-reddish color, exhibiting a thin disintegrated layer; fracture, glossy; odor, faintly like copaiba; melting-point, beginning at  $105^{\circ}\text{C.}$ , and becoming clear at  $175^{\circ}\text{C.}$  Soluble to the amount of 55 per cent. in ether, 48 per cent. in alcohol, 28 per cent. in acetone, 33 per cent. in methyl-alcohol, 80 per cent. in amyl-alcohol, 24 per cent. in chloroform, 15 per cent. in petroleum-ether, 26 per cent. in benzoyl, and 85 per cent. in alcohol-ether; very sparingly soluble in carbon tetrachloride, and in oil of turpentine; acid number: direct, 117.7; indirect, 124.8; saponification number: cold, after 24 hours, 138.6; hot, after 1 hour, 152.6; hot, after 2 hours, 149.2. The chemical constituents determined were: 48 to 50 per cent. of *Congocopalic acid*, ( $\text{C}_{19}\text{H}_{30}\text{O}_2$ ); 5 to 6 per cent. of *a-Congo copal resin*; and 3 to 4 per cent. of *Volatile Oil* (b.p. 165–168); from the ether-soluble portion. From this portion insoluble in ether, 22 per cent. of *Congocopalic acid* ( $\text{C}_{22}\text{H}_{34}\text{O}_3$ ), soluble in ether, and 12 per cent.  *$\beta$ -Congo-copal resin*, insoluble in ether. The *ash* amounted to 4–5 per cent.

*Benguela-Copal* (white) occurred as a more or less impure mixture of light and dark pieces, balls, stalactites, and plates of very variable size, frequently showing a puffed surface, and here and there a disintegrated layer—some of the larger pieces enclosing a reddish, very malodorous fluid. The lower melting-point is from  $106^{\circ}$ – $108^{\circ}\text{C.}$ , the upper, from  $156^{\circ}$ – $158^{\circ}\text{C.}$  The solubility-percentages were similar to those obtained with *Congo-copal*; the acid-number: direct = 112–114.8; indirect = 117.6–120.4; the saponification-number: cold = 117.6–123.2; hot = 120.4–123.2. The chemical constituents determined were: 43 to 45 per cent. of *Bengucopalic acid* ( $\text{C}_{19}\text{H}_{30}\text{O}_2$ ); 22 per cent. of *Bengucopalic acid* ( $\text{C}_{22}\text{H}_{34}\text{O}_3$ ); 4 to 5 per cent. of *a-resen* (soluble in ether); 14 to 16 per cent. of  *$\beta$ -resen* (insoluble in ether); 3 to 4 per cent. of *volatile oil*; and 5 to 6 per cent. of *ash* and impurities.—Arch. d. Pharm., 246 (1908), No. 4, 293–305.

## B. ANIMAL DRUGS.

*Cantharides.*—Frank E. Eldred and W. C. Bartholomew contribute a paper on the estimation of cantharidin in cantharides and preparations in the "Proceedings" of this Association, 1907, 360–364.

*Cantharides—Microscopic Examination of the Powder.*—C. N. Peltriset recommends the following method for preparing powdered cantharides for microscopic examination: A little of the powder is added to a mixture of

a drop of glycerin, with an equal quantity of solution of chloral hydrate; after a quarter of an hour a portion of the mixture is diffused through a drop of glycerin, and examined. Decolorization with chlorinated soda is slow and incomplete, but treatment with nitric acid, slightly diluted, gives very good preparations in which the fragments of muscles are stained a straw-yellow color. Staining with an alcoholic solution of nigrosin (two-thirds) and safranin (one-third) after decolorization may also be adopted. The following are the chief tissues observable in the powder: (*a*) *Fragments of the wing cases*.—These exhibit distinct hexagonal reticulations on the surface, the meshes being very finely pitted; here and there are the dark scars of bristles. These fragments are very characteristic. (*b*) *Portions of the membranous wings*.—Those which are very transparent, bear short-pointed hair, and contain vessels. (*c*) *Fragments of the chitinous skeleton*.—Very dark brown, with conspicuous bright points. (*d*) *Muscular fibres*, generally grouped into bundles. (*e*) *Portions of the respiratory tubes*, which are spirally marked, and branch freely. Fragments of the eyes, oesophagus, etc., are also to be found.—Pharm. Journ., Aug. 3, 1907, 185; from Bull. des Sci. Pharm., 14, 262.

*Cochineal—Estimation of Coloring Value*.—Caesar & Loretz (Herbstbericht, 1907) recommend a method for the estimation of the tinctorial power of cochineal which depends on a colorimetric comparison of its alkaline solution with a standard solution of potassium permanganate. It is carried out as follows:

*A*. 1 Gm. of powdered, dry cochineal is heated for one hour on a steam-bath with a solution of 5 Gm. KOH in 20 Gm. of water; when cool the product is diluted to 100 Cc., well shaken, and filtered through cotton.

*B*. 0.316 Gm. of potassium permanganate is dissolved in 1000 Cc. of water, and 12.5 Cc. of this solution are diluted in a glass cylinder to 100 Cc. with water.

For comparison, 100 Cc. of distilled water are placed in a glass cylinder of the same size and shape, and solution *A* is added until the color is identical with that of the diluted solution *B*. This should require 2.5 Cc. of solution *A* if the cochineal is of normal quality.—Pharm. Ztg., lii (1907), No. 74, 778.

*Honey—Acid Content*.—F. Utz finds that the G. P. definition of permissible acidity in honey, viz., 0.23 per cent. in the crude and 0.184 per cent. in purified honey, calculated as formic acid, is in so far correct as it represents average figures. He has, however, found natural honeys that give appreciably higher figures. Pure bees' honeys were found to vary in their acidity from 0.0644 to 0.3312 per cent., but these figures are materially lowered by heating the honey.—Pharm. Ztg., liii (1908), No. 10, 99; from Pharm. Post, 1908, Nos. 6 and 7.

*Artificial Honey—Method of Recognition*.—Franz Felix Werner calls

attention to the method recently communicated by Dr. J. Fiehe for the recognition of artificial honey and its distinction from the natural product. The method is based upon the fact that in the artificial inversion of cane sugar, which is usually employed for preparing the sophisticated article, certain by-products of decomposition are formed, which are soluble in ether and are not present in natural honey, and that the products extracted by ether give reactions which clearly demonstrate the distinction from the latter. The ether-extraction of the artificial honey is allowed to evaporate spontaneously to dryness; on adding a few drops of resorcin hydrochloric acid (1 per cent. solution in fuming HCl) to the perfectly dried residue, an orange-red color is produced, which changes rapidly to a cherry-red. The residue obtained in the same way from natural honey does not produce this reaction.—Pharm. Ztg., liii (1908), No. 32, 320.

*Beeswax—Solubility in Ether at the Ordinary Temperature.*—Gg. Buchner finds that beeswax is only partially soluble in ether at the ordinary temperature, about 70 per cent. of the ether-insoluble, light-brownish, and very hard wax remaining undissolved. The 30 per cent. of ether-soluble wax constitutes a deep yellow, tolerably soft mass, containing the greater part of the cerotinic acid, the coloring matter, the hydrocarbons and the cerolein. The portion insoluble in cold ether contains, besides an insignificant quantity of cerotinic acid the principal content of the wax esters. If, therefore, beeswax is to be separated from any of its admixtures by extraction with ether, this should be done by the aid of heat; but the author suggests carbon tetrachloride as a better solvent for this purpose.—Pharm. Ztg., lii (1907), No. 55, 574; from Chem. Ztg., 1907, No. 45.

*Propolis—Characters and Composition.*—Dr. P. Bohrisch has made a study and chemical examination of the peculiar resinous body, known as *propolis*, which is the substance with which the honey-bee cements and coats the inner surface of the honey-comb cells, and which has enjoyed from early antiquity a popular reputation as a vulnerary. It forms a dark yellowish or brownish, pliable mass, having a balsamic odor, and is supposed to be derived from the buds of poplars, birches and similar trees. The specimen of propolis examined by the author contained 43.6 per cent. of propolis resin, insoluble in hot petroleum ether, soluble in 96 per cent. alcohol; 8.7 per cent. of propolis balsam, soluble in petroleum ether and in 70 per cent. alcohol; 27.9 per cent. of beeswax; 6.9 per cent. of essential oil; water and volatile matter, and 12.9 per cent. of insoluble impurities. Propolis resin is a brown, very aromatic substance, which can be kneaded with water; melting-point, 67° C. Heated for several hours at 101° C. it becomes converted into a mass resembling tolu balsam in consistence. The petroleum ether soluble part is waxy in consistence, and has an acid value 28.4, markedly higher than that of beeswax. This



is due to the presence of propolis balsam, which is removed by treatment with 70 per cent. alcohol; it is a golden-yellow, clear, bitter, aromatic, syrupy liquid; acid value 74.86; saponification value 165.1.—Pharm. Centralh., xlviii (1907), No. 45, 929-934.

*Spider Silk—Characters and Possible Utility.*—E. Fischer says that a large Madagascar spider, *Nephila madagascariensis*, spins a handsome orange-yellow silk, which would appear to be available for the manufacture of textile fabrics. It differs from silkworm silk in containing much less sericin, the substance soluble in boiling water. When treated with this solvent it gives only about 3 per cent. of soluble matter, whereas ordinary silk yields 30 per cent. The insoluble portion appears to be closely allied to fibroin of ordinary silk; that is, the portion insoluble in water but readily dissolving in strong hydrochloric acid, the solution affording, when poured into alcohol, a chlorine-free product, insoluble in water, named sericoïn by Wehl. The products of hydrolysis of spider silk by acids are practically the same as those obtained from fibroin, and the amounts of glycocoll, alanine, tyrosine, and leucine are the same, but the quantity of proline and of diamine acids is somewhat higher from spider silk than from fibroin. Spider silk also contains a small amount of glutamic acid, which is not found in fibroin. On the other hand, it yields no serin. Spider silk yields up its yellow coloring-matter to alkalis, the insoluble fiber being rendered almost colorless by successive treatment with alkaline solutions.—Pharm. Journ., Mar. 28, 1908, 413; from Ztschr. Physiolog. Chem., 53 (1907), 126; through Jour. de Pharm. et Chim., 27 (1908), 251.

*Commercial Egg-Yolk—Distinction of the Yolk of Hen's Eggs from that of Duck's Eggs.*—Experiments made by J. Paessler confirm the observation of Schorlemmer and Sichling that the values found for pure egg-yolk cannot be applied to commercial egg-yolk which has been preserved with sodium chloride, since the presence of this as well as of other preservatives determine more or less material changes in its composition. The following numbers were obtained with fat from egg-yolks which had been preserved for weeks with 12 per cent. of sodium chloride:

<i>Fat from</i>	<i>Yolk of Hen's Eggs.</i>			<i>Yolk of Duck's Eggs.</i>
Iodine number.....	48.1	42.0	47.5	54.2
Unsaponifiable.....	3.1 per cent.,	3.8 per cent.,	3.3 per cent.	6.2 per cent.
Phosphorus, as $H_3PO_4$	3.7 per cent.,	3.7 per cent.,	3.7 per cent.	3.1 per cent.

From these figures it becomes apparent that the content of non-saponifiable matter in the fat serves as the best criterion of distinction between the yolks of hen's and duck's eggs.—Pharm. Ztg., liii (1908), No. 29, 290; from Chem. C.-Bl., 1908, i, No. 11.

# INORGANIC CHEMISTRY.

## GENERAL SUBJECTS.

*Inorganic Chemical Compounds.*—Oscar Oldberg contributes some notes on the classification of the principal inorganic compounds, based on the modern definition of acids, bases and salts according to the theory of ionization, in the "Proceedings" of this Association, 1907, 419-422.

*Medicinal Chemistry—Effect of Exposure to Greatly Reduced Temperatures.*—C. Strzyzowski has studied the effect of exposure to very low temperature on a number of substances, the experiment being made by placing several cubic centimeters or grammes of the substance in a thin test-tube, and immersing this in liquid air ( $-190^{\circ}\text{C}.$ ) for about 5 minutes. The results of his observations are in the main confirmatory of those that have already been made by others—such as the loss of reactionary power, diminution or extinction of color and odor, solidification and friability of the substances as the temperature approaches the zero, etc. The following observations concerning a number of medicinal chemicals, however, selected from the long series of substances examined, may serve as noteworthy examples:

*Ether* congeals to form a whitish, crystalline, opaque and odorless mass, which when dropped into strong alcohol sinks to the bottom.

*Liquid Ammonium Sulphide* congeals to form an opaque, canary-yellow, amorphous and absolutely inodorous mass.

*Amyl nitrite* forms a perfectly odorless, crystalline, glassy mass, becoming fissured under crepitation.

*Guaiacol* crepitates on congealing, becoming hard, pale rose-red and nearly odorless.

*Mercurous Iodide* assumes a striking (Veronese) green color, and the red *Mercuric Iodide* changes to a picric acid-yellow.

*Liquor Ferri Sesquichloridi* becomes a glassy, transparent body, having a fine green color.

*Volatile Oil of Mustard* is converted into a solid, yellowish-white, amorphous mass, which is odorless at  $-190^{\circ}\text{C}.$

*Sodium Bicarbonate and Sulphuric Acid* fail to react. If  $\text{H}_2\text{SO}_4$  is dropped onto the  $\text{NaHCO}_3$ , exposed to the liquid-air bath, no  $\text{CO}_2$  is evolved. The acid congeals on the surface of the bicarbonate, forming a glassy mass.—Pharm. Ztg., liii (1908), No. 29, 288-289; from Pharm. Post, 1908, No. 23.

*Chemical Compounds of the U. S. P.*—The physical constants of these are the subject of discussion by Atherton Seidell in a paper communicated to the Association, in "Proceedings," 1907, 473-479.

*Atomic Combining Values.*—The importance of a true conception and expression of atomic combining values is the subject of a paper by Oscar Oldberg, in the "Proceedings" of this Association, 1907, 401-419.

*Drugs and Chemicals—Official (B. P.) Testing.*—J. P. Gilmour observes that many retail pharmacists are deterred from engaging in the systematic testing of drugs and chemicals for two reasons; the first being that such work lies beyond the reach of any one save a professional analytical chemist, and the second, that even if this disability were overcome, the labor is too troublesome and costly to be compatible with ordinary shop business. He considers that neither of these views is justified. With some addition of intelligence, the qualifying examination (of the Br. Pharm. Society) is adequate for the analytical knowledge and skill demanded for B. P. testing and pharmaceutical testing generally, while the second inhibitory cause is rendered inoperative by a reference to the B. P. Appendix, giving the list of reagents, test-solutions, etc. Most of the materials are included in the regular stock of every pharmacist in business, and the rest are, for the most part, cheap and easily procurable. The test and volumetric solutions can be readily prepared and keep well, and the following list of apparatus serves for an approximately complete outfit: Chemical balance and set of gramme weights; microscope, 50 to 300 or 500 diameters; burette and stand, nitrometer, set of beakers, stoppered liter flask, set of flasks, set of evaporating basins, test-tubes, glass-tubing, two separators, copper water-bath with rings, chemical thermometer,  $-20^{\circ}$  to  $360^{\circ}$  C., specific gravity bottle or pycnometer, fractionating flask, cubic centimeter measures and pipettes, platinum foil and wire.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1907, 446-455.

*Moisture—Detection of Mere Traces.*—W. Biltz calls attention to a new reaction for detecting traces of moisture, which depends on the fact that the colorless double iodide of lead and potassium turns yellow on coming in contact with water, owing to the formation of ordinary lead iodide. The double salt is prepared by mixing together warm solutions of 4 Gm. of lead nitrate in 15 Cc. of water, and of 15 Gm. of potassium iodide in 15 Cc. of water. On cooling, the yellow precipitate of lead iodide, which is at first formed, gradually disappears, and the whole mixture sets to a mass of almost colorless needles of the double salt. The crystals are rapidly filtered over a pump, and dissolved in 15 to 20 Cc. of acetone. A filter-paper soaked in the acetone solution and dried at  $100^{\circ}$  to  $110^{\circ}$  C., was unaffected by exposure to a current of air dried by bubbling through 98 per cent. sulphuric acid, but was turned yellow after being exposed for one hour to a current of air which had been only partially dried by bubbling through 78 per cent. sulphuric acid. Moisture may be detected in an organic liquid by allowing it to drop from a funnel into a dry stoppered flask containing a filter-paper, which after being moistened with

some of the acetone solution was dried *in situ* by a current of dry air. Such paper was at once turned yellow by alcohol which did not alter the color of anhydrous copper sulphate.—Pharm. Journ., Aug. 3, 1907, 185; Ber. d. d. Ch. Ges., 40 (1907) 2182.

#### OXYGEN.

*Ozone—Acid Properties.*—W. Manchot and W. Kampschulte demonstrate the acid properties of ozone by the following observations: With ammonia at the ordinary temperature ozone forms dense mists, which do not contain nitric oxide. Similar phenomena are observed with organic bases such as methylamine, trimethylamine, piperidine, etc., and with strong bases it is more marked than with weak. Ozone forms compounds with the caustic alkalies, and the stability of the compound decreases as the atomic weight of the metal falls; thus the caesium derivative is the most stable and the lithium derivative the least. Mg, Ca, Sr and Ba oxides destroy ozone rapidly at the temperature of the room, and heat is evolved by the reaction. The compounds formed are decomposed by water. The acid properties of ozone are also shown by the fact that blue litmus is colored distinctly red, and other indicators give a decidedly acid reaction with it. It makes water conduct an electric current. The acid properties of ozone seem to belong partly to a decomposition product which appears to be the decomposition product of a hydrate of ozone. The mist formed with ammonia must contain this product.—Chem. News, Febr. 7, 1908, 72; from Ber. d. D. Chem. Ges., 40 (1907), No. 18.

#### HALOGENS.

*Acid. Hydrochlor., Dil., U. S. P., VIII.—Assay of Commercial Samples.*—S. H. Feldman assayed 10 samples of diluted hydrochloric acid obtained from different pharmacists, the results ranging from 9.5 to 12.3 per cent. HCl—average 11.05 per cent.—Amer. Journ. Pharm., Aug., 1907, 367.

*Bromine—Microchemical Detection.*—E. Pozzi Escot describes the following method for the detection of traces of bromine with the aid of the microscope: One or two Cc. of the solution to be tested are introduced into a small flask fitted with a bent narrow delivery tube; a few drops of sulphuric acid and also of saturated solution of chromic acid. A minute test tube containing one or two drops of solution of aniline or of pure aniline is attached to the extremity of the delivery tube as a receiver. The contents of the flask are then boiled gently for several minutes. If bromine be present this will distil over and combine with aniline, sometimes in sufficient quantity to form a copious visible white flocculent precipitate. But this does not invariably consist of tribromophenol, since aldehydic bodies may give a similar result. The microscopic appearance of tribromophenol is, however, distinctive. The amorphous precipitate quickly assumes a crystalline form, consisting of very minute prisms, filling

the field of the microscope with bodies resembling bacteria in appearance, often accompanied by larger prisms or long needles. The bacteria form is occasionally aggregated into rosettes.—Pharm. Journ., Sept. 21, 1907, 381; from Annal. de Chim. Analyt., 12 (1907), 319.

*Anhydrous Metallic Bromides—Preparation from Metallic Oxides.*—F. Bourion finds that at a temperature below a red heat hydrobromic acid converts metallic oxides, which are easy to reduce, such as those of nickel and cobalt, and also the oxides of the rare earths, into anhydrous bromides. The preparation is rendered easier if small quantities of sulphur chloride is added to the acid. This chloride is totally converted into bromide, and acts as a diluent to the acid, and effects the conversion of the whole of the oxide into bromide; when the hydrobromic acid alone is passed rapidly over the hot oxide, the transformation is incomplete owing to the pastiness of the mass. Moreover, the sulphur bromide reacts on the water-vapor formed and regenerates hydrobromic acid, and the rate of the reaction is increased. The sulphur chloride must be heated to between 60° and 90° C. The bromides thus prepared from oxides include the following compounds: ThBr<sub>4</sub>, CrBr<sub>3</sub>, NiBr<sub>2</sub>, CoBr<sub>2</sub>, NdBr<sub>3</sub>, CeBr<sub>3</sub>, ThOBr<sub>2</sub>, LaBr<sub>3</sub>, SmBr<sub>3</sub>, PrBr<sub>3</sub>, GdBr<sub>3</sub>, DyBr<sub>3</sub>, YtBr<sub>3</sub>, TbBr<sub>3</sub>; the last eight compounds being obtained for the first time.—Chem. News, Aug. 30, 1907, 107; from Compt. rend., 145 (1907), No. 4.

*Alkali Iodides—Detection of Nitrates.*—Baroni observes that the usual method of detecting nitrates in alkaline iodides by means of nascent hydrogen, formed by the action of an alkali on zinc, is defective in that the alkaline liquids, from their liability to absorb extraneous ammonia, may thus erroneously indicate the presence of nitrates. The following method excludes such a source of error: 1 Gm. of the iodide to be examined is dissolved in water, and precipitated by a sufficient quantity of a 5 per cent. solution of mercuric chloride. The solution is filtered and examined for nitrate with ferrous sulphate or diphenylamine: The absence of iodates is assumed.—Pharm. Journ., May 2, 1908, 572; from Giorn. di Farm. di Torino, through Rev. Pharm., March, 1908, 81.

*Iodine—An Important Product of Japanese Industry.*—A special correspondent of the "Chemist and Druggist" mentions that among the chemical exhibits at the recent Tokio Exhibition, two important industries were prominently in evidence, viz.: 1. Acids, alkalies and superphosphates; 2. Iodine. This is manufactured in Japan in the little villages round the coast. The seaweed is gathered and a very crude iodine extracted, which is sold to the large dealers, who further refine it and sell for home consumption or export. With these small producers there is no capital invested and no large factories. In slack times the iodine is made, and the cost of production is practically nil. The industry is comparatively new, but capable of very intensive development both in Japan

itself and also in Formosa, Korea, and Saghalin. The large dealers have until recently been in keen competition, and the buying of kelp and the crude iodine from the small villages has been consequently at a figure which left the exporters small profit, but now matters are likely to be different, as all the main manufacturers and dealers have been brought together and a company formed, styled the "Japan Chemical Industry Co., Ltd." A new and up-to-date factory will be erected, and, in addition to buying cheaper from the villagers, a considerable reduction will be made in the cost of manufacture.—Chem. & Drugg., Oct. 5, 1907, 555.

*Iodine—Determination in the Crude Drug.*—Cormimboeuf recommends the following method for the determination of iodine in crude and commercial sublimed iodine: A quantity of the sample (about 3 Gm.) is exactly weighed off in a small closed tube, and transferred to a small flask containing 20 to 25 Cc. of water. To this about 1 Gm. of iron filings (not reduced iron) is gradually added, and the mixture agitated until the liquid is colorless or green. This is then filtered into a graduated 250 Cc. flask, the insoluble matter being washed to bring the volume to 250 Cc. Of this, 50 Cc. is pipetted off into a 100-Cc. flask, and treated with 0.5 to 1.0 Gm. of pure sodium carbonate, or sufficient to give an alkaline reaction; after thorough mixing the volume is made up to 100 Cc., and 50 Cc. is filtered off, representing 25 Cc. of the original liquid. This is acidified with nitric acid, rendered alkaline with one-fourth its volume of ammonia, and again filtered; the iodine is precipitated as silver iodide in the usual manner from this filtrate. The weight obtained  $\times 0.540 \times 10$  gives the amount of iodine in the quantity taken of the original sample. Chlorine remains in the ammoniacal liquid; it may be determined by acidifying this with nitric acid, and collecting the precipitated silver chloride.—Pharm. Journ., Sept. 28, 1907; from Annal. de Chim. Analyt., 12, (1907), 307.

*Iodine—Therapeutic Action of Violet-Colored and Brown Solution in Chloroform.*—According to L. Carcano the violet-colored solution of iodine in chloroform has no action upon the skin. If, however, this violet-colored solution is cooled by means of liquid air to  $-191^{\circ}$  C., the color is changed to brown, and its effect on the skin is the same as that of the ordinary brown tincture. The author concludes from this that the conditions of therapeutic energy of iodine must be distinct from each other in the violet and in the brown solution.—Pharm. Ztg., liii (1908), No. 29, 289; from Boll. Chim. Farm., 1908, No. 1.

*Fluorine—Occurrence in Snail-Shells.*—Having previously found fluorine as a constituent of the shells of marine molluscs, P. Carles has now examined those of *Helix pomatia*, the large terrestrial snail which furnishes the table delicacy "escaryots," and also *H. aspera*. These were found to contain fluorine to the extent of 0.002 to 0.003 per cent., con-

siderably less than the amount found in oyster and mussel shells. Water snails' shells are found to contain the same quantity of fluorine as snails' shells.—Pharm. Journ., Sept. 14, 1907, 361; from Jour. de Pharm. et Chim., 26 (1907), 101.

## HELIUM.

*Helium—Abundant Presence in Samarskite and other Uranium Minerals.*

—According to F. Bordas, helium is very abundant, and seems to be combined with the uranium in samarskite, noehteite, euxenite, yttrantinite, and anneroedite; less helium is found in woehlerite, pyrochlore, polycrase, troegerite, xenotime, gummite, thorite-orangite, and niobite-columbite. The minerals in which the salts of uranium are sharply defined or crystallized do not yield helium, *e. g.*, torbernite, autunite, carnotite. Helium has been detected by its line  $\lambda = 5878$  in a sample of native bismuth from Saxony, and of bismuth with smaltine from Cornwall.—Chem. News, June 5, 1908, 275; from Compt. rend. 146 (1908), No. 17.

## SULPHUR.

*Sulphur—Igniting Point in Air.*—In a paper on the igniting point of sulphur (Ch. News., xcv, 169), Mr. Rutherford Hill had indicated 248° C. as the lowest point observed by him at which sulphur will ignite spontaneously in air, but that in subsequent experiments ignition occurred at 255° C. R. H. McCrea and A. Wilson have made experiments, which showed that at temperatures below 255° C. sulphur refused to ignite, but that at temperatures above 255° C. ignition easily took place. In this determination much depends on the conditions under which the experiment is made. The authors found the temperature of ignition in air, the bulb of the thermometer being placed in the bath on a level with the bend of the U-tube (containing the sulphur), to be 261° C.—correction having been made for the exposed part of the stem.—Chem. News., July 19, 1907, 25.

*Sulphur—Detection in the Free State.*—E. Berger recommends a method for the detection of free sulphur, which is based on its decomposition by means of fuming nitric acid and potassium bromide. The bromine liberated combines with the sulphur, and the sulphur bromide thus formed is immediately decomposed by the excess of acid present. The reaction takes place in the cold. The determination is thus performed. A quantity of the material containing 0.1 to 0.2 Gm. of sulphur is placed in a small capsule; 10 Cc. of fuming nitric acid is added, and then 0.5 to 1.0 Gm. of potassium bromide. After a few minutes the whole is evaporated to dryness on a water-bath; the residue is taken up with a few Cc. of hydrochloric acid, two or three times, evaporating to dryness each time. Finally, the residue is dissolved in water, and the sulphuric acid thus obtained is determined.—Pharm. Journ., May 2, 1908, 572; from Compt. rend., through Rev. Pharm., March, 1908, 78.

*Pure Hydrogen Sulphide—Preparation.*—R. L. Wilson observes that when obtained by the ordinary method of preparation, from ferrous sulphide and hydrochloric acid, hydrogen sulphide frequently contains hydrogen arsenide and phosphide. If, on the other hand, a drying tower be filled with granulated soda-lime or with a mixture of calcium hydroxide and moistened shot, and the impure  $\text{H}_2\text{S}$  gas is conducted into this, the compound  $\text{Ca}(\text{SH})(\text{OH})$  is formed with development of heat and of a yellow color, which can thus be progressively observed until the conversion is complete, while the impurities mentioned are carried off with the combustible gas (hydrogen) issuing from the tower. If now carbon dioxide is admitted into the tower, pure  $\text{H}_2\text{S}$  is generated and continues until the calcium sulphide is exhausted, or the flow of carbon dioxide is cut off. The generation of  $\text{H}_2\text{S}$  is thus perfectly under control. The possible inconvenience caused by the presence of carbon dioxide may be obviated by employing two towers, similarly charged, so that any  $\text{CO}_2$  passing through the first tower will be intercepted in the second through which it must pass before it is used. As soon as the first tower is exhausted (which is indicated by the change in color), the second tower takes the place of the first, and a freshly charged tower that of the second.—Pharm. Ztg., lii (1907), No. 55, 574; from Chem. Centralbl., 1907, i, No. 15.

*Hydrogen Sulphide.*—Convenient preparation from "*Aluminum Sulphide*," which see.

*Gas Generator—Construction for Analytical Work.*—Eugene Müller recommends for analytical work the gas generator illustrated by Fig. 69. It consists of a U-tube of suitable dimensions, each limb provided with a hollow ground-glass stopper having a lateral hole coinciding with a similar hole in the limbs of the U-tube, one of the holes of the latter opening into a delivery tube for the generated gas. The action of the apparatus is self-evident and requires little explanation. The stopper *a* being open the acid enters the limb containing the material from which the gas is to be liberated; when closed the liquid is forced back into the limb serving as a reservoir, the stopper *b* being open. If it is desirable to operate with the gas under pressure the stopper *b* is closed during the generation.—Pharm. Ztg., liii (1908), No. 7, 67; from Chem. Ztg., 1907, 101.

*Simple Gas Generator—A Device for Analytical Operations.*—James M. C. Sanders describes the simple little gas generator shown by Fig. 70, which serves a very useful purpose in analytical operations and conveniently replaces the so-called "constant supply" apparatus commonly in use. It consists of a glass tube open at one end and having a fine, almost capillary, tube fused into the other end, as shown. For the preparation of hydrogen sulphide, for example, it suffices to drop one or two small fragments of ferrous sulphide into the annular space (*A*), then to add a few drops of dilute sulphuric acid and to close the mouth (*B*) of the tube



with the forefinger. The gas evolved is then delivered from the orifice (*c*) into the liquid to be treated by introducing the apparatus into the test-

FIG. 69.

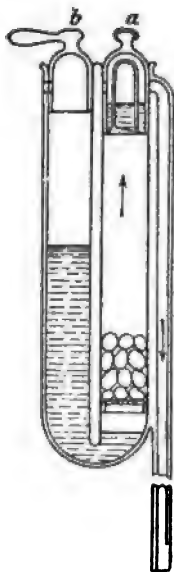


FIG. 70.



Gas Generators.

tube containing it, using it at the same time as an agitator.—Chem. News, Nov. 29, 1907, 267.

*Thiosulphocarbamates—General Characters.*—Marcel Delépine has prepared the thiosulphocarbamates of nickel, cobalt, copper, sodium, barium, zinc, silver, lead and iron, and finds them to exhibit the following general properties: They tend to crystallize with their solvents. The salts of the alkalis and alkaline earths and of zinc are colorless, while those of copper, nickel, cobalt and iron are colored. The nickel, cobalt, iron, and copper salts,  $[(C_4H_9)_2N.CS_2]_2Ni$ ,  $[(C_4H_9)_2N.CS_2]_3Co-Fe$ , are not ionized in organic solvents, and hence the salts behave indifferently towards ordinary reagents.—Chem. News, June 12, 1908, 288; from Compt. rend., 146 (1908), No. 19.

*Sulphuric Acid—A Product of the Combustion of Illuminating Gas.*—Having on several occasions tested the corroded coating on a copper water-bath and found a fair amount of sulphates, D. B. Dott, in various ways described, demonstrated the presence of sulphuric acid among the

products of combustion of the coal gas employed as a source of heat. On passing the gas through water containing subacetate of lead, not the slightest color was produced: but on passing it through water containing a little soda, and colored with phenolphthalein, the color disappeared in a short time. These reactions indicate the probable presence of sulphurous acid in the gas.—Chem. & Drugg., Aug. 31, 1907, 377.

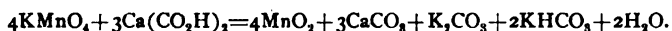
#### PHOSPHORUS.

*Red Phosphorus—Properties.*—G. Linck and P. Möller find that when purified dried red phosphorus is sublimed at the melting-point of lead in an exhausted glass tube a black brittle mass, which shows no trace of crystallization, is obtained. In thin fragments it appears red, and contains 99.4 per cent. of phosphorus. The specific gravity determinations gave results which varied from 2.145 to 2.192 at 18–20° C., and this agrees almost exactly with that of commercial red phosphorus. By prolonged heating in a closed tube both forms can be converted into the crystalline form, the powder becoming a light red. From this it appears that a modification of phosphorus exists which is labile as regards the densest known form, and which possibly forms the isotropic amorphous phase, corresponding to red crystalline phosphorus. Mixtures of arsenic and phosphorus can readily be obtained if red phosphorus and metallic arsenic are sublimed together; the product of the sublimation exhibits a conchoidal fracture and a black metallic luster, and in very thin splinters appears brown in transmitted light. The specific gravity varies between fairly wide limits according to the percentage composition.—Chem. News, June 26, 1908, 312; from Ber. d. D. Chem. Ges., 41 (1908), 407.

*Phosphorus Nitride—Preparation and Properties.*—Alfred Stock and Hans Grüneberg use phosphorus pentasulphide and ammonia to prepare pure phosphorus nitride ( $P_3N_3$ ), the ammonia being obtained pure by distilling it from commercial ammonia and drying by means of caustic alkali. In order to make phosphorus nitride, the ammonia need not act upon the pentasulphide in the cold, but it is sufficient if the latter is saturated with ammonia at the ordinary temperature. When the complicated mixture of ammonium thiophosphates thus prepared is heated,  $P_3N_3$  is obtained. It is best to heat in a current of ammonia, and all the phosphorus of the original pentasulphide is readily converted into the nitride; in fact, no other nitride can be prepared so easily in a pure state. The density of  $P_3N_3$  at 18° C. is 2.51. Its color varies from pure white to fairly dark reddish-brown. The dark coloration is produced when it is heated for some time to temperatures above 850° C., and the authors thought that it must be due to the presence of some free red phosphorus. However, when a dark preparation was allowed to cool quite slowly from 900° C. to the temperature of the room in an absolute vacuum, the color did not disappear, although free phosphorus would certainly have evaporated.

At the ordinary temperature  $P_3N_3$  is very indifferent. It does not redden litmus paper unless it is heated for some time with water to  $100^\circ C$ . When warmed *in vacuo* it begins to decompose into phosphorus and nitrogen at  $760^\circ C$ . The nitride may also be prepared in an impure state by heating a mixture of phosphorus pentasulphide and ammonium chloride, and small quantities of it remain when the reaction products of yellow phosphorus or solid phosphine with liquid ammonia are heated to a sufficiently high temperature.—Chem. News, July 12, 1907, 23; from Ber. d. D. Chem. Ges., 40 (1907), No. 9.

*Phosphorous Acid—Determination.*—C. Marie and A. Lucas recommend the following procedure in determining phosphorous acid by permanganate in alkaline solution. A known volume of standard permanganate is warmed with potassium carbonate, and the phosphorous acid introduced into it. A brown precipitate of dioxide is at once formed. It is left for about fifteen minutes at  $80^\circ C$ ., and then a known volume of strongly acid solution of Mohr's salt is added. The precipitate at once dissolves, and the excess of ferrous salt is titrated by means of the solution of permanganate. It is best to determine the ratio of the two solutions (Mohr's salt and permanganate) by a blank experiment carried out under the same conditions. The strength of the permanganate can be determined by the usual methods, but it is preferable to use a substance which can be oxidized in an alkaline medium. Calcium formate is very suitable for this purpose. The equation is—



Phosphites and hypophosphites which are readily oxidized to phosphites can be determined by this method.—Chem. News., Aug. 9, 1907, 70; from Compt. rend., 145 (1907), No. 1.

*Phosphoric Acid—Iodometric Method of Estimation.*—Prof. Virgil Coblenz and Otto B. May find that the U. S. P. alkalimetric determination of phosphoric acid gives irregular results, depending on the degree of dilution of the acid in the experiment. In search of an available method for pharmacopœial purposes, they find such in the iodometric one, proposed by A. Christensen, which is simple and gives uniform results, agreeing accurately with gravimetric determinations. The method is based on the reaction taking place between phosphoric acid, potassium iodide and bromate in solution, whereby a molecular equivalent quantity of iodine is liberated for each molecule of phosphoric acid present—the liberated iodine being estimated as usual with sodium thiosulphate, V. S. The preliminary reaction is conducted in a closed stoppered bottle, which is immersed for 10 minutes in a bath of water at the temperature of  $65^\circ C$ . This is the one fault in the method, since it is difficult to avoid loss of iodine at  $65^\circ C$ ., owing to the failure of even specially constructed pressure vials to seal securely. Experiments have, however, shown that 1

conducting the digestion at the ordinary room temperature ( $20^{\circ}$  C.) and prolonging the reaction to  $2\frac{1}{2}$  or 3 hours in the securely stoppered flask, concordant results are readily obtained.—*Amer. Journ. Pharm.*, April, 1908, 151-154.

*Phosphoric Acid—Utility of Silver Nitrate in the Volumetric Determination.*—Dr. A. B. Lyons has conducted some experiments with the view of securing more exact results in acidimetric titrations of phosphoric acid, which lead him to the following conclusions: (1) Phosphoric acid (uncombined) can be determined with reasonable accuracy by titration with an alkali hydroxide, using cochineal as indicator. (2) The determination can be made with greater precision by titrating with  $\frac{N}{25}$  lime water in presence of silver nitrate, using phenolphthalein as indicator, taking care that the silver salt be present in amount slightly less than sufficient to precipitate the whole of the phosphoric acid. (3) Useful results can also be obtained by titration with lime water in presence of an excess of silver nitrate, the quantity of phosphoric acid calculated either directly from the amount of silver phosphate thrown down, or indirectly by determining the residual silver from a measured volume of a decinormal solution after precipitation of the phosphate. (4) Phosphoric acid in phosphate of the alkalis (even in presence of chlorides) may be determined by a volumetric method depending on its precipitation as silver phosphate.—*Amer. Drugg.*, April 13, 1908, 173-174.

Referring to the above, Otto B. May observes that Dr. Lyons has apparently overlooked that the volumetric estimation of phosphates by means of silver nitrate was proposed by A. F. Holleman in 1894, (see *Proceedings*, 1895, 928.) In his paper Holleman says: "The principle [of the estimation of phosphoric acid] consists in precipitating the phosphoric acid in a solution of biphosphates, by means of silver nitrate solution of known strength, after adding sufficient sodium acetate to neutralize the liberated nitric acid. The silver phosphate is filtered off, and the uncombined silver estimated in an aliquot part of the filtrate, according to Volhard. \* \* \* To estimate the phosphoric acid in acid solution, it is necessary to add sufficient alkali until phenolphthalein turns red, that is: until the phosphoric acid is converted into a biphosphate." As this method seems to be less tedious than that of Dr. Lyons, Mr. May calls attention to it.—*Ibid.*, April 27, 1908, 226.

#### BORON.

*Borides of Iron—Preparation and Properties.*—Binet du Jassonneix has obtained the borides of iron,  $\text{Fe}_2\text{B}$  and  $\text{FeB}_2$ , as follows: Mixtures of varying proportions of iron and boron were heated in a magnesia boat in a porcelain tube through which a current of hydrogen was passed. Mixtures which are infusible at the temperature at which porcelain begins to soften were heated in magnesia crucibles in the electric furnace. The

melts obtained looked crystalline when up to 7 per cent. of boron was present. The surface and fracture showed long prismatic needles, which could be isolated by allowing cold dilute hydrochloric acid to act upon the melt for some time. These crystals have the formula  $\text{Fe}_2\text{B}$ . When the percentage of boron was above 7 the crystallization appeared less regular. Melts with about 9 per cent. of boron appeared homogeneous, and were completely dissolved by cold hydrochloric acid. The boride,  $\text{Fe}_2\text{B}$ , consists of steel-gray crystals; its density at  $18^\circ$  is 7.37; it oxidizes in dry air only at a red heat, but in damp air it is rapidly altered; it dissolves very slowly in dilute or concentrated hydrochloric or sulphuric acids when warmed, but is not attacked by the cold acids. Warm dilute nitric acid dissolves it, and the concentrated acid attacks it very rapidly in the cold. The compound  $\text{FeB}$ , when prepared in an electric arc furnace contains a large amount of carbon boride. When most of this is removed a metallic powder is obtained; it is not attacked either by hot or cold dilute hydrochloric acid; the concentrated acid slowly attacks it when heated; nitric acid dissolves it easily, leaving a residue of carbon boride; it is oxidized slowly in the air.—Chem. News., Aug. 16, 1907, 83; from Compt. rend., 145 (1907), No. 2.

*Borides of Nickel and Cobalt—Preparation and Properties.*—Binet du Jassonneix finds that if mixtures of nickel or cobalt and boron are heated to  $1100^\circ$  or  $1200^\circ$  C. in a current of hydrogen, products are obtained which in their properties and structure recall the corresponding compounds of iron. The cobalt product, which contains about 5 per cent. of boron, is attacked very slowly by warm hydrochloric acid. The residue then left contains 8.5 per cent. of boron, and consists of the compound  $\text{Co}_2\text{B}$ . The corresponding nickel product does not yield a definite boride when treated with hydrochloric acid. If an ingot of the melt is used as anode in a solution of nickel chloride and a current is passed, the anode rapidly yields a metallic powder with composition corresponding to the formula  $\text{Ni}_2\text{B}$ . When the amount of boron exceeds 20 per cent., products are obtained which are more fusible than those which contain iron. The highest percentage of boron reached in these compounds is 27.1 and 27.2 respectively, corresponding to  $\text{CoB}_2$  and  $\text{NiB}_2$ .—Chem. News, Aug. 30, 1907, 107; from Compt. rend., 145 (1907), No. 4.

#### SILICON.

*Magnesium Silicide—Composition and Properties.*—The metallographic examination of silicon compounds of magnesium apparently showing that only one magnesium silicide exists, Paul Lebeau and Robert Bossuet isolated the crystals of the silicide by eliminating the magnesium as magnesium organic compound, and determined the amount of magnesium and silicon they contain. The results obtained agree closely with the formula  $\text{SiMg}_2$ . Thus the direct action of magnesium on silicon leads to the for-

mation of only one definite compound, having the formula  $\text{SiMg}_2$ . This compound crystallizes in the magnesium, but can be separated by removing the metal as magnesium organic compound. This silicide of magnesium is completely dissociated *in vacuo* or in a current of hydrogen at  $1200^\circ \text{C}$ .—Chem. News, March 20, 1908, 143; from Compt. rend., 146 (1908), No. 6.

*Platinum and Palladium Silicides* have been obtained and are described under the respective metals, which see.

#### CARBON.

*Graphite—Oxidizing and Decolorizing Properties.*—In order to determine the decolorizing power of graphite, Henri Louis Dejust shook 1 Gm. of it with 42 Cc. of a solution of litmus containing 9.8 Gm. of extract per liter at  $100^\circ \text{C}$ . After shaking for thirty seconds it was filtered, and the colors of the filtrates compared with one another. The same graphite after purification (reducing its carbon to 93.1 per cent.) produced less decoloration. If the medium in which the operation takes place is acid, neutral, or basic, the effect is unaltered. With animal black, however, in a neutral or acid solution the decoloration is total, while in a basic solution it is less than when purified graphite is used. Graphite has an oxidizing action like that of animal black. A solution of paraphenylene diamine left in air in contact with graphite in the cold turns brown, and this effect is accelerated by heating. It also decolorizes a solution of litmus in absence of air; for example, when a flask of the solution which has been boiled is completely filled.—Chem. News, July 5, 1907, 11; from Comp. rend., 144 (1907), No. 23.

*Jet—Its Origin.*—Percy E. Spielmann has made an examination of some samples of Whitby jet under the direction of Prof. E. J. Constan, at the Eidgenössische Prüfungsanstalt für Brennstoffe at Zürich, with the object of determining the natural origin of jet. The substance was considered from the point of view of a fuel; chemical analyses and determinations of heating values were made for comparison with similar results for coals of various kinds, examined in the ordinary routine of such a laboratory. A comparison of the results for the pure jet with those obtained for cannel coal, shows a great similarity between the two, and, taking into consideration the results of other investigators, make it evident that jet must be classed with cannel coal rather than with lignite, whose composition is very different. Although analogous results for bitumen have not been published anywhere, within the author's knowledge, a calculation made on an average sample gave, as result, a heating value of 10019 cal., the average heating value of lignite being 5500 cal.; of cannel coal 8277 cal., and of jet 8438 cal. From this, together with analyses recorded in a previous paper, it follows that jet is far removed

from bitumen, compared with cannel coal.—Chem. News, April 16, 1908, 181-183.

*Animal Charcoal—Decolorizing Action.*—Prof. Edmund Knecht communicates a preliminary paper on the decolorizing action of animal charcoal, for the simple purpose at this time of securing priority on two points, viz., that animal charcoal contains a considerable amount of fixed nitrogen, and that its decolorizing action on a typical acid dye-stuff, such as "crystal-scarlet," for example, is in a direct ratio to the amount of nitrogen contained in the animal charcoal.—Trans. Brit. Pharm. Conf. (Year-book of Pharmacy), 1907, 431-433.

*Calcium Carbide—Synthesis on a Small Scale.*—According to Edmund Knecht the synthesis on a small scale of calcium carbide may readily be effected as follows: A piece of metallic calcium about the size of a pea is placed in a cavity cut out of a piece of charcoal and heated with a small blow-pipe flame. The metal burns with a brilliant orange-colored flame, and then disappears into the charcoal. On breaking up the latter a hard lump of calcium carbide is found in the center.—Pharm. Journ., April 11, 1908, 486; from Ber. d. D. Chem. Ges., 41 (1908), 498.

*Percarbonic Acid—Saline Compounds.*—Richard Wolfenstein and E. Peltner find that when carbon dioxide acts upon an excess of barium dioxide, the gas is absorbed and *barium percarbonate* results according to the equation  $\text{BaO}_2 + \text{CO}_2 = \text{BaCO}_4$ . When more carbon dioxide is passed in, hydrogen peroxide is rapidly evolved, and the percarbonate is decomposed as shown by the equation  $\text{BaCO}_4 + \text{H}_2\text{O} + \text{CO}_2 = \text{BaCO}_3 + \text{H}_2\text{O}_2 + \text{CO}_2$ . Probably the bicarbonate,  $\text{Ba} < \begin{smallmatrix} \text{HCO}_4 \\ \text{HCO}_3 \end{smallmatrix}$ , is formed as an intermediate product. Thus the formation of hydrogen peroxide from barium peroxide takes place in two stages. Barium percarbonate is a light yellow substance which decomposes when warmed and when allowed to stand in air. With dilute acid it gives hydrogen peroxide, and hence it is in all probability a true salt of percarbonic acid. The authors have also prepared four

*Sodium Salts of Percarbonic Acid*, viz.: Sodium dioxide carbonate,  $\text{Na}_2\text{CO}_4$ ; sodium dioxide bicarbonate,  $\text{Na}_2\text{C}_2\text{O}_4$ ; sodium trioxide carbonate,  $\text{Na}_3\text{CO}_5$ ; sodium trioxide bicarbonate,  $\text{NaHCO}_4$ . Sodium dioxide carbonate is prepared by the action of carbon dioxide on sodium dioxide hydrate at a low temperature. It loses oxygen rapidly even in a desiccator and attempts to re-crystallize it have not as yet been successful. The bicarbonate of sodium dioxide results when  $\text{Na}_2\text{CO}_4$  is saturated with carbon dioxide. It is considerable more stable than the carbonate. The third salt, sodium trioxide carbonate, is obtained when carbon dioxide acts upon sodium trioxide hydrate. This hydrate has already been described by Tafel under the name natryl hydrate, and is formed when alco-

hol acts upon sodium peroxide,  $C_2H_5OH + O : Na.ONa = C_2H_5.ONa + O : Na.OH$ . Prolonged action of carbon dioxide upon natryl hydrate gives the bicarbonate,  $NaHCO_3$ . All these salts are exceedingly easily decomposed by water. They behave like true percarbonic acid salts, and not like carbonic acid salts with hydrogen peroxide of crystallization.—Chem. News., March 20, 1908, 143; from Ber. d. Chem. Ges., 41 (1908), No. 2.

#### CYANOGEN COMPOUNDS.

*Anhydrous Hydrocyanic Acid—Cause of Spontaneous Explosion.*—T. Pollacci has observed that small quantities of a black substance invariably adhered to the fragments of glass vials containing anhydrous hydrocyanic acid, which had exploded spontaneously, although carefully kept covered with sand, in a cool place (during winter), and protected from light. This black mass, yielding besides water also ammonium carbonate, the author suggests the polymerization of the hydrocyanic acid as the cause of its spontaneous explosion.—Pharm. Ztg., lii (1907), No. 55, 574.

*Hydrocyanic Acid—Nature of the Black Product of its Decomposition.*—T. Pollacci observes that the nature of the black substance which forms by the slow decomposition of prussic acid has been the subject of much conjecture. A product of somewhat similar appearance is formed by the decomposition which occurs with explosive violence, when the concentrated acid, 90 to 100 per cent., is stored in glass. This substance is light, black, and shows bright points resembling anthracite. It is considered to be a polymer of HCN. It contains no ammonia, as such. When slowly heated it constantly evolves hydrocyanic acid and ammonia, until it is dissipated at about  $500^\circ C$ .—Pharm. Journ., Febr. 8, 1908, 151; from Boll. Chim. Farm., 1907, 287, through Journ. de Pharm. et Chim., 27 (1908), 32.

*Mercuric Cyanide—Simple Total Analysis.*—E. Rupp and F. Lehmann observe that under circumstances it may be of importance to determine the mercury-ion as well as the cyanogen-ion in preparations of mercuric cyanides, instead of basing the result of the analysis upon the figures obtained by the determination of either by itself. These two determinations are readily effected by volumetric methods which are based upon the following principle discovered by the authors:

*The cyanogen-ion* can, by means of alkaline iodine solution, be quantitatively converted into the cyanic acid-ion according to the following equation:  $Cy' + NaIO = CyO' + NaI$ , and is therefore determinable by means of  $\frac{N}{10}$  iodine solution.

*The mercury* is converted into mercury-potassium iodide in alkaline solution, reduced to metal by means of formaldehyde, and then reconverted into mercuric iodide by means of  $\frac{N}{10}$  iodine solution. For the details of the method the original paper may be consulted in Pharm Ztg., lii (1907), No. 98, 1020.



*Mercuric Cyanide—Economical Preparation.*—E. Rupp and S. Gay recommend cyanide of sodium, which is now obtainable cheaply and of a high degree of purity (98 per cent.), for the preparation of mercuric cyanide. To a boiling solution of 31 Gm. of this finely-powdered sodium cyanide in 50 Cc. of water, 90 Gm. of mercuric sulphate is added in small quantities at a time, with constant stirring. The conversion of the latter is quite rapid in the boiling mixture. In case the sand-like precipitate of mercuric cyanide does not show the absence of yellow basic sulphate after a short time, a little more sodium cyanide must be added, until the yellow color disappears. On cooling the mixture congeals to form a solid mass, which is triturated to powder and extracted with about 200 Cc. of hot 95-per cent. alcohol in an extraction apparatus. The alcohol is distilled off and the residue recrystallized from water. In this way the authors have obtained a nearly pure mercuric cyanide in form of long, brilliant white needles.—Apoth. Ztg., xxiii (1908), No. 42, 373.

*Mercuric Oxycyanide—Commercial Variability.*—Attention having been directed to the variable composition of mercuric oxycyanide of the market, confirming the observations recorded by Holdermann (see Proceedings, 1906, 827-828), leads Rupp to describe chemical and physical characteristics by means of which the pure salt, corresponding to the requirements of the 1906 supplement of the G. P., may be distinguished from the commercial salts containing mercuric cyanide as impurity. The latter is easily distinguished by its ready solubility in water, and the content of oxycyanide conveniently determined by titrating the commercial compound in solution containing sodium chloride, with hydrochloric acid, as recommended by Holdermann in the article above referred to.—Pharm. Ztg., lii (1907), No. 95, 994.

*Mercuric Oxycyanide—Probable Superiority as an Antiseptic of the Impure (Commercial) Salt Over the Pure Salt of the G. P. Supplement, 1906.*—Referring to a recent stricture concerning the impurity of mercuric oxycyanide supplied by certain manufacturing firms, the firm of E. Merck declare in rejoinder that, conceding this impurity, as demonstrated by Holdermann in 1905, (see Proceedings, 1906, 827), they have continued to supply the impure salt obtained by the older method of preparation, unless the demand is distinctly made for the pure mercuric salt, which they also supply and have listed with the qualification: "Ergänzungsbuch z. D. A., 1906" (=supplement to the G. P. IV). They explain that this is done on the ground that all the clinical experiments that have demonstrated the antiseptic value, as far as they have been reported in the literature, were made with the mercuric oxycyanide obtained by the older process of manufacture, and because of the doubtful efficiency of the pure oxycyanide.—Pharm. Ztg., lii (1907), No. 96, 1001.

## ALKALIES.

*Fused Potassium Hydroxide, G. P.—Percentage of KOH too High.*—F. Stengel directs attention to the fact that it is practically impossible to produce fused potassium hydroxide containing *at least 90 per cent. KOH* in the form of white sticks, as demanded by the G. P., IV. To prepare a potassium hydroxide of such high percentage the preparation must inevitably be more or less gray in color, since the silver of the vessel employed for the fusion is attacked and the product is contaminated with silver oxide. A percentage of KOH above 82 to 85 per cent. is impracticable, a fact which has also been noted by E. Merck in his "Prüfung der chemischen Reagentien auf Reinheit."—Pharm. Ztg., liii (1908), No. 47, 468; from Ztschr. d. Oesterr. Ap.-Ver., 1908, No. 21.

*Alcoholic Potash—Preparation.*—A. Scholl mentions that alcoholic solution of potash prepared by heating caustic potash over a water-bath with alcohol is liable to become too concentrated, and if heated in this condition to 40° C. the solution turns brown. If powdered potash is shaken up with cold alcohol the greater part of it dissolves, the remainder going into solution on gently warming the mixture for about half an hour.—Pharm. Journ., June 6, 1908, 760; from Ztschr. f. Unters. d. Nahr. u. Genussm., 15 (1908), 343-344.

*Sodium—Precaution in Cutting.*—D. P. McDonald observes that in cutting sodium (by means of the Gattermann knife) considerable difficulty arises from the softening of the metal by the warmth of the hand and by the friction, which makes it very apt to stick to the blade of the knife. This difficulty may be overcome if, from time to time, the lump of sodium is dipped in anhydrous ether for a moment, whereby the metal becomes chilled, and is further cooled by the evaporation of the ether from its surface. The slices may then be dropped into a basin containing the ether, which serves the purpose above mentioned.—Chem. News, Feb. 14, 1908, 73.

*Metallic Sodium—Method of Pulverization.*—C. Matignon, in a paper dealing with the drying of gases, describes a method for reducing metallic sodium to fine powder along with sodium chloride required as a desiccating material. The sodium to be pulverized is placed in a mortar with a neutral salt, which does not react with the metal, and is in a perfectly dry state, such as fused sodium chloride. The two substances are bruised together, preferably in an atmosphere of carbon dioxide, or the mortar may be covered with a piece of rubber sheeting, through which a hole has been cut for the pestle; the elasticity of the rubber permits of free movements of the pestle. There is practically no danger of the sodium taking fire during the process of crushing, but it is necessary that no nitrates or other oxidizing salts should be present. With the much more inflammable alkali metal potassium, care should be taken to have a sufficiently large propor-

tion of the fused sodium chloride present.—Pharm. Journ., May 2, 1908, 572; from Bull. Soc. Chim., March 20, 1908, 353.

*Ammonia—Synthesis in Presence of Water.*—M. Woltereck finds that when mixtures of air and hydrogen are passed over iron sesquioxide ammonia is obtained, the most favorable temperature for the reaction being 300–350° C. Better results are obtained when water vapor and air are passed over heated turf, and sugar carbon can also be employed. Thus small quantities of ammonia are formed during oxidations in presence of water, provided that the temperature does not exceed 700° C.—Chem. News, Mar. 6, 1908, 119; from Compt. rend., 146 (1908), No. 3.

*Ammonia—Synthesis from its Elements.*—Léon Brunel and Paul Woog prepared mixtures of nitrogen and hydrogen (1 vol. to 3 vols.), and passed them at different temperatures and with different velocities over substances which would be likely to act as catalysers. With finely-divided carbon, obtained by the decomposition of toluene or carbon dioxide by reduced nickel, no ammonia is formed between the temperatures of 170° and 285° C. But if under the same conditions the nitrogen in the gaseous mixture is replaced by air a certain amount of carbon burns, and the heat disengaged by this reaction leads to the formation of small quantities of ammonia.—Chem. News, Dec. 20, 1907, 304; from Compt. rend., 145 (1907), No. 22.

*Ammonium Carbonate—Protection from Deterioration.*—L. E. Wilson recommends the simple expedient of placing a small piece of cotton or sponge, saturated with stronger water of ammonia into the bottom of the bottle containing ammonium carbonate to prevent the latter from turning white and conversion into bicarbonate.—Bull. Pharm., Sept., 1907, 380.

*Sulphammonium—Question of its Existence as a Typical Ammonium Compound.*—In 1905 Ruff and Geisel stated that the action of sulphur upon ammonia may be represented by the reversible equation  $10S + 16NH_3 \rightleftharpoons N_4S_4 + 6(NH_4)_2S$ , and that the coloration of sulphammonium is produced only in presence of free sulphur, which gives a colloidal solution with the liquefied ammonia. To establish the fact P. Lebeau and P. Damoiseau have endeavored to show the presence of sulphuretted hydrogen and nitrogen sulphide in sulphammonium. However, as a trace of an impurity is often sufficient to bring about a reaction, the authors thought that a trace of water—which is difficult to avoid in the case of a gas as hygroscopic as ammonia—might play some part in the reaction. They therefore repeated the experiments, taking special precautions to ensure the absence of moisture, and then found that Ruff and Geisel's reversible reaction does not represent the true facts unless water is present; and, moreover, their observations on the stability and the identity of the coloration of solutions of sulphammonium containing very different proportions of sulphur and ammonia, show that Moissan's conclusions regarding the

existence of sulphammonium as a type of ammonium compound are not disproved.—Chem. News, July 26, 1907, 47: from Compt. rend., 144 (1908), No. 25.

*Ammonium-Calcium Sulphate (Ammonium Syngenite)*—*Formula*.—In order to determine whether ammonium syngenite contains one molecule of water or two, J. D'Ans subjected the pure salt to a pressure of some thousand atmospheres in a hydraulic press, thus freeing it almost entirely from its mother liquor. The salt was then powdered, and again pressed between filter-paper. When then dried in a desiccator it gave up 80 per cent. of water. At  $170^{\circ}\text{C}$ . it gave up 6.02 per cent., and on ignition it lost 47.66 per cent. of  $(\text{NH}_4)_2\text{SO}_4$ . These results prove conclusively that the salt has the formula  $\text{CaSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 + \text{H}_2\text{O}$ .—Chem. News, March 20, 1908, 143; from Ber. d. D. Chem. Ges., 41 (1908), No. 2.

*Lithium—Apparent Production from Copper*.—In a letter to "Nature," Sir William Ramsay announced the apparent production of lithium in a copper solution by the emanations from radium (see also Radio-Active Minerals under *Radium*). It had been previously shown by himself and Mr. Soddy that the spontaneous change of the emanation from radium results in the formation of helium. Other researches have shown that when the radium emanation is in contact with, and dissolved in water, the inert gas which is procured by the change consists mainly of neon; only a trace of helium could be detected. When a saturated solution of copper sulphate was substituted for water no helium was produced; the main product being argon, possibly containing a trace of neon, for some of the stronger of its lines appear to be present in the spectrum. The residue after the removal of the copper from this solution, showed the spectra of sodium and of calcium, (which might have been derived from the glass of the container); the red lithium line was also observed, but was faint. This last observation has been made four times, in two cases with copper sulphate and in two with copper nitrate; all possible precautions were taken, and similar residues from lead nitrate and from water gave no indication of the presence of lithium; nor was lithium detected in a solution of copper nitrate. The apparent result is spoken of by Sir William Ramsay as a "degradation" of copper into lithium.—Drugg. Circ., Sept., 1907, 584.

*Rubidium-Calcium Sulphates—Preparation and Properties*.—J. D'Ans and W. Leh obtain rubidium-calcium sulphate as follows: Finely divided gypsum is added to a 30 per cent. solution of rubidium sulphate and the mixture allowed to stand in the cold. The salt which separates out is washed with alcohol and ether. The rubidium syngenite crystallizes in long needles, and is isomorphous with potassium and ammonium syngenites. A sulphate,  $\text{Rb}_2\text{Ca}_4(\text{SO}_4)_8$ , separates when 30 per cent. rubidium sulphate solution is boiled with gypsum. No rubidium pentacalcium sul-

phate,  $\text{Rb}_4\text{Ca}_5(\text{SO}_4)_6\cdot\text{H}_2\text{O}$ , has yet been obtained ; if it exists its preparation probably requires a lower temperature and a low  $\text{RbSO}_4$  concentration.—Chem. News, Jan. 31, 1908, 60 ; from Ber. d. D. Chem. Ges., 40 (1907), No. 18.

#### ALKALINE EARTHS.

*Calcium—Its Properties and Possibilities.*—Arthur E. Pratt describes calcium and discusses its industrial possibilities. It is a silvery-white metal readily oxidized in moist air. It is very light (sp. gr. 1.52), fairly malleable, has a high specific heat, and is a good conductor of electricity. It is about as hard as aluminum, but at  $400^\circ\text{C}$ . becomes as soft as lead. It is volatile, and can be sublimed *in vacuo* between  $700^\circ\text{C}$ . and  $800^\circ\text{C}$ ., and melts at the latter temperature. It is a powerful reducing agent, and its most promising application is as such and for the refining of metals. In the latter case it acts in three distinct ways : (1) By reducing oxides and sulphides ; (2) by eliminating dissolved gases ; (3) by forming compounds with certain impurities, thus rendering them less deleterious. All three modes of action are strikingly shown in the case of copper. A suitable addition of calcium will remedy "dry" or "sulphury" copper, give a sound casting, and give a soft and tough ingot with prohibitive proportions of bismuth or antimony, besides restoring ordinary overpoled copper to tough pitch. If excess of calcium is present, however, it induces brittleness on its own account. As regards alloys, the chief effect of calcium being to produce brittleness, crystallization and hardness, no alloy of calcium, with two doubtful exceptions, has shown any promise of commercial utility so far as physical properties are concerned, the only likely application in this direction being its hardening property.—Chem. News, Aug. 30, 1907, 100.

*Calcium Chloride, B. P.—Method of Determining Official Quality.*—B. C. Cowley, with the object of putting dispensing chemists on their guard, observes that the calcium chloride which is now official is that containing two molecules of water, obtained by heating calcium chloride to  $200^\circ\text{C}$ . It is described in the Pharmacopœia as occurring in dry, white, very deliquescent masses. The fully hydrated salt, which contains six molecules of water, and compounds with varying amounts of water down to the anhydrous form, are commercially obtainable. The appearance of the salt is comparatively little guide in judging of the amount of water it contains, for a salt containing three molecules of water is very similar in appearance to one with two molecules. The simplest and most rapid means of estimating the amount of water in the salt is to titrate it by means of a normal solution of sodium carbonate at a temperature of about  $100^\circ\text{C}$ ., using phenolphthalein as an indicator. The end of the reaction is quite sharp. An inexperienced operator will be somewhat disconcerted by the appearance of pink color on the addition of phenolphthalein to the

solution of some samples, but this disappears on running in the solution of sodium carbonate.—Chem. & Drugg., Mar. 21, 1908, 460.

*Barium Salts.*—Quantitative precipitation by *Arsenic and Arsenous acids* under certain provisions, which see under "Arsenic."

*Magnesium Carbonate—Silica a Common Impurity.*—C. M. McClure gives the results of the chemical analysis of magnesium carbonate. Five of six samples contained small quantities of silica, to the presence of which he attributes the difficulty in filtering and keeping stock solution of magnesium citrate.—Amer. Journ. Pharm., Aug., 1907, 365.

#### EARTHS.

*Aluminum Sulphides—Preparation and Convenient Use for Preparing  $H_2S$ .*—According to Fonze-Diacon, aluminum sulphide is readily prepared by placing a mixture of aluminum and sulphur on a layer of calcined magnesia in the bottom of a mortar—to prevent adhesion of the sulphide—on heating the mortar and contents, yellow aluminum sulphide is quickly formed. This compound serves advantageously for preparing  $H_2S$ , without the use of acids, a current of this gas being readily produced in the usual way by the simple addition of water.—Pharm. Ztg., lii (1907), No. 65, 681; from Rép. de Pharm., 1907, No. 7.

*Beryllium—Proof of Divalence.*—B. Glassman has found that when pure picric acid is dissolved in water, warmed, neutralized with beryllium carbonate, filtered, and evaporated to crystallization, a yellow picrate crystallizes out. When dried in air and analyzed the

*Beryllium Picrate* so obtained is found to have the formula  $[C_6H_2(NO_2)_3O]_2Be + 3H_2O$ . If this picrate is treated with ether and dried at  $50^\circ C.$ , it gives up one molecule of water. The molecular weight of the anhydrous picrate was determined by the freezing-point method in acetophenone, care being taken that the latter was absolutely free from water. The molecular weight was found in two experiments to be 465 and 471.1, while the calculated value is 465.1. Thus the divalence of beryllium is confirmed by this work. When the anhydrous picrate is treated with water it gives a basic picrate of the formula,  $[C_6H_2(NO_2)_3O]_2Be \cdot 20Be(OH)_2$ .—Chem. News, Aug. 16, 1907, 84; from Ber. d. D. Chem. Ges., 40 (1907), No. 11.

*Beryllium Chromates—Preparation and Composition.*—B. Glassmann obtains beryllium chromate,  $BeCrO_4 \cdot H_2O$ , by neutralizing a warm concentrated solution of chromic acid with beryllium carbonate and crystallizing the salt by cooling. So obtained, it is in form of reddish monoclinic crystals. The salt is decomposed by water with separation of

*Basic Beryllium Chromate*,  $BeCrO_4 \cdot 6Be(OH)_2$ , a yellow insoluble powder, having a constant composition, which may also be obtained by precipitating a solution of beryllium sulphate with solution of ammonium chromate.—Ber. d. D. Chem. Ges., 40 (1907), 2602.

## RARE EARTHS.

*Yttrium Group of Rare Earths—Study of Terbium and Dysprosium Compounds.*—G. Urbain and G. Jantsch have begun a study of the elements of the yttrium group of rare earths in order to find out what relations exist between the different members of the series, and to devise less tedious processes for their separation than those hitherto employed. In their present paper they give the results of experiments with terbium and dysprosium, and describe the following compounds: Terbium peroxide,  $Tb_2O_7$ ; terbium nitrate,  $Tb(NO_3)_3 \cdot 6H_2O$ ; terbium sulphate,  $Tb_2(SO_4)_3 \cdot 8H_2O$ ; terbium chloride,  $TbCl_3 \cdot 6H_2O$ . Dysprosium does not form a peroxide. The salts of the oxide ( $Dy_2O_3$ ) are light yellowish-green in color and have the following composition: Dysprosium nitrate,  $DyNO_3 \cdot 5H_2O$ ; dysprosium sulphate,  $Dy_2(SO_4)_3 \cdot 8H_2O$ ; dysprosium chloride,  $DyCl_3 \cdot 6H_2O$ .—Chem. News., Febr. 14, 1908, 75–76; from Compt. rend., 146 (1908), 127.

*Yttrium Earths—Separation by Fractional Crystallization of Their Bromates.*—After pointing out the deficiencies and objections to the different methods that have been proposed for the separation of the rare earths from each other, either by fractional precipitation or crystallization, C. James observes that fractional precipitation to be of value must be very rapid. Fractional crystallization is to be preferred, for it is much easier to carry out a large number of operations. As a rule, in fractional precipitation methods, especially where dilute solutions are employed, a good deal, if not most of the material, is washed away. It is highly desirable, therefore, that a method consisting of fractional crystallization of some type of isomorphous compounds, with greatly varying solubilities, should be found. With this object in view, the author has examined the sulphites, xanthates, succinates, double carbonates with sodium, glycollates, methylsulphates, normal propylsulphates, camphorates, iodates, sulphocyanides, sulphocyanide double compounds with mercuric cyanide, monochloracetates, monobromsuccinates, oleates, ferrocyanides, bromates, etc., besides nearly every compound proposed in literature for the purpose of fractionation. The bromates are the best suited for the purpose of all those examined up to the present time. The bromates are easily prepared by using barium bromate, which in turn is formed by mixing boiling solutions containing the required amounts of barium chloride and potassium bromate. As potassium bromate can be prepared cheaply the rare earth bromates are not costly to obtain.

The rare-earth material, generally in the form of the oxalates, is mixed into a paste with sulphuric acid, and the temperature raised until the fumes of sulphuric acid cease to be evolved. The residue is then finely powdered, dissolved in ice-cold water, and the resulting solution poured over an excess of barium bromate. This operation is best carried out in

a large evaporating dish placed on the water-bath, care being taken to keep the mass well stirred. After a time the precipitate is allowed to settle, and some of the clear liquid taken up by means of a pipette and added to a warm solution of barium bromate; if no precipitate is obtained the liquid is filtered off. Sometimes, however, a precipitate is formed which consists of barium bromate, and therefore it is best to dilute with water and boil. If the precipitate persists, either more stirring or more barium bromate is required. When the double decomposition is complete, a little bromine is often liberated, but not sufficient to cause any inconvenience in the laboratory. This is evidently due to bromic acid liberated by a trace of free sulphuric acid accompanying the rare-earth sulphates, which should therefore be well ignited. The filtered liquid is now evaporated until a drop removed at the end of a glass rod solidifies when stirred on a watch glass. Under these conditions just about half of the substance in solution crystallizes out on cooling; but after a little experience there is absolutely no difficulty in judging the most convenient concentration. Referring to the original paper for further particulars, it may be here mentioned that the rare-earth bromates arrange themselves in the following order of solubility: Samarium (europium?, gadolinium?) terbium, yttrium, dysprosium, holmium, erbium, thulium, and ytterbium, which is similar to the solubilities of the oxalates in ammonium oxalate, but different from the ethylsulphates; since, according to Urbain, yttrium, erbium and ytterbium ethylsulphates are found in the most soluble portion. A fair conclusion can be drawn that the use of the ethylsulphate method would prove valuable in conjunction with the bromate, especially for the separation of yttrium from dysprosium and holmium, and perhaps for the separation of thulium from ytterbium.—Chem. News, Feb. 7, 1908, 61-62.

In a second paper, Mr. James communicates a description in detail of a *Scheme for the Separation of the Rare Earths*, in which he applies the method of fractional crystallization of their bromates. These are considered in the following successive order: Zirconium and thorium, cerium and thorium, thorium, cerium, lanthanum, etc.; lanthanum, praseodymium, neodymium, samarium and europium, gadolinium, terbium, dysprosium and holmium, yttrium, erbium, thulium, ytterbium and scandium. The fractionation of the least basic earths is still under investigation, with the object of preparing pure thulium for a determination of the atomic weight, and also to confirm Urbain's "lutecium."—Chem. News., May 1, 1908, 205-209.

*Lutecium—A New Element Split from Marignac's Ytterbium.*—In the course of studies on the elements of the ytterbium group, G. Urbain detected in the arc spectra of certain fractionations of Marignac's ytterbia many lines, which could not be seen in the first fraction, or which were very



faint in it. Following up this observation, he has obtained results which lead to the conclusion that Marignac's ytterbium is a mixture of two elements, neo-ytterbium, and a new element which in honor of Paris he proposes to name "lutecium," Lu, derived from the ancient name of that city. The atomic weight of lutecium is not much above 174, while that of neo-ytterbium cannot differ much from 170.—Chem. News., Dec. 6, 1907, 271-272.

*Neo-erbium—Elementary Identity.*—Krüss and Nilson having questioned the elementary nature of the neo-erbium obtained by Cleve after having separated from the old erbium the accompanying elements scandium, ytterbium, thulium and holmium, K. A. Hoffmann and O. Burger have undertaken an investigation which proved that the neo-erbium earth obtained by Cleve and Nilson's method still contained impurities, which, however, for the most part appeared to be thulium, holmium, and dysprosium. In the course of their further researches, in which they found the method of the partial crystallization of the ethylsulphates, as suggested by Urbain, to be very useful for the separation of dysprosium and neoholmium, the authors eventually obtained a product which possessed elementary identity as regards spectrum and equivalent weight. The latter corresponds very closely to the figure 167.43 ( $O = 16$ ,  $S = 32.06$ ). The specific weight of the neo-erbium earth, obtained by igniting the sulphate at  $1100^{\circ}C$ ., was found to be 8.616 at  $15^{\circ}C$ . The accurate measurements of the beautifully sharp spectrum will be reported later.—Chem. News, March 27, 1908, 145-146; from Ber. d. D. Chem. Ges., 41 (1908), 308.

#### ZINC.

*Zinc—Volumetric Determination.*—A. R. Thornewell suggests and describes in detail an improved method for the volumetric determination of zinc, which has the advantages that the end reaction is quite sharp, and zinc is not used in standardizing the solutions employed. Its principal disadvantage is having to wait for the zinc sulphide precipitate to settle. The method is based on the following reactions:

1.  $2NaOH + H_2S = Na_2S + 2H_2O$ .
2.  $ZnSO_4 + Na_2S = ZnS + Na_2SO_4$ .
3.  $Na_2S + H_2SO_4 = Na_2SO_4 + H_2S$ .

Normal soda solution is saturated with hydrogen sulphide, the zinc precipitated with this solution, and the excess of soda titrated. It can be looked upon as NaOH, and not  $Na_2S$ , as the sulphide is only a means to an end, and acts under the condition of the experiment as an alkali.—Chem. & Drugg., Sept. 7, 1907, 413.

*Artificial Calamines—Use in Dermatological Practice.*—In search of some innocuous coloring matter suitable to impart a color approximating

to the normal color of the skin to lotions, ointments, powders, etc., Professor R. B. Wild found the best way to do it was to make powders of artificial calamines of various kinds, to alter the color until he got the color of the skin itself, and then, by the use of the tintometer, estimate the color value of that particular powder. Having examined all kinds of coloring matters, including various iron oxides, he found jewelers' rouge and Armenian bole to be the most suitable for the purpose. An analysis of the colors showed that these two substances, when diluted, came very near indeed to the color of the normal skin, and the calamines were very easily made from them. By diluting them down they got a color which had no shade at all, but simply a very pale kind of pink. This could be produced by the addition of 1 per cent. of jewelers' rouge or  $1\frac{1}{4}$  per cent. of Armenian bole to zinc oxide or zinc carbonate.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1907, 406-408.

*Potassium Ammonozincate—Preparation and Properties.*—E. C. Franklin describes potassium ammonozincate, which he prepared by the action of an excess of potassium amide in solution in liquid ammonia on pure, water-free ammoniated zinc iodide. The details are carried out in an apparatus specially designed for the purpose. Analysis shows that the composition of the salt is expressed by the formula  $\text{Zn}(\text{NHK})_2\text{NH}_3$ . It occurs in colorless, well-formed crystals, and is but slightly soluble in liquid ammonia, but dissolves energetically and with evolution of much heat, in dilute aqueous acids; soluble also in ammoniacal solutions of ammonia salts. Water converts it into ammonia, zinc hydroxide, and potassium hydroxide, while short exposure to the action of the moisture of the air produces a superficial, sticky layer on the clean, dry crystals. It is not explosive. When heated *in vacuo* it remains unaffected up to  $160^\circ\text{C}$ .; as the temperature is increased it melts and gives off ammonia.—Pharm. Journ., Jan. 25, 1908, 89; from Journ. Amer. Chem. Soc., 29, No. 9.

#### COPPER.

*Copper—Probable Conversion into Lithium by Radium Emanation.*—See "Lithium."

*Metallic Copper—Precipitation.*—The following method, which was devised by E. Knecht as a lecture experiment, serves equally well as a delicate reaction for copper. To 1 or 2 liters of distilled water is added 1 Cc. of a 10-per cent. solution of copper sulphate, and then about 5 Cc. of commercial titanium sesquisulphate solution, and the whole well stirred. In a few minutes a separation of metallic copper begins, which, by reflected light, shows the characteristic color of the pure metal, and by transmitted light appears blue. The precipitate is so finely divided that filter-paper retains only a small proportion of it. The reaction is still perceptible in a 1 in 1,000,000 solution, but the more dilute the solution

the slower the separation. In concentrated solutions (for example, one containing 1 gramme of copper sulphate in 1 liter) the precipitation is almost instantaneous; the liquid then is not transparent, and it has the appearance of solid copper.—Pharm. Journ., April 25, 1908, 548; from Ber. d. D. Chem. Ges., xli (1908), No. 3, 498.

*Copper Mirrors—Possible Industrial Production.*—In the course of an investigation on the oxidation of aromatic hydrazines, F. D. Chattaway made the observation that when solutions of cupric oxide are reduced by these compounds the metal is deposited upon the glass in the form of a brilliant coherent film if clean vessels are used. The mirrors obtained by this method are very beautiful, as they show the lustrous red color of burnished copper, and are as perfect in reflecting surface and as uniform as the similar mirrors obtained by the deposition of silver. It seems probable that this method of depositing copper upon glass could receive important application in the production of objects of art.—Chem. News., Aug. 23, 1907, 85.

*Ammoniacal Cuprous Sulphate—Preparation and Composition.*—Bouzat communicates the following method for obtaining ammoniacal cuprous sulphate: Cuprous oxide and ammonium sulphate are dissolved in an aqueous solution of ammonia. To the solution thus obtained, alcohol is added, when a precipitate of the ammoniacal cuprous sulphate is thrown down. The great difficulty in obtaining the pure salt lies in the necessity of avoiding oxidation. For this purpose all the operations (precipitation, filtration, washing) must be conducted in an atmosphere of hydrogen. The alcohol employed should be deprived of air by boiling. With proper precautions the salt may be obtained as a perfectly white crystalline powder. The precipitation is carried out at a temperature of about 50° C. After filtration the product is washed first with alcohol which has been boiled, then with ether which has been distilled with sodium, and boiled. The substance, dried at the ordinary temperature, loses about 1 per cent. of its weight at 60° to 80° C. It has the composition,  $\text{Cu}_2\text{SO}_4(\text{NH}_3)_4$ . When well dried the substance is easily managed, but if it contains small traces of mother liquor it is oxidized by the air instantaneously with green coloration, and evolution of heat. It is decomposed by water, with formation of cuprous oxide, and it reduces nitric acid with evolution of ruddy vapors. Treated with dilute sulphuric acid, it yields a precipitate of copper with copper sulphate and ammonium sulphate in solution.—Pharm. Journ., June 20, 1908, 806; from Compt. rend., 146 (1908), 75.

## MERCURY.

*Mercury—Purification.*—According to William Bettel, mercury may be purified from gold and other metals by leaving it for some days in contact with a 2 per cent. solution of 98 per cent. cyanide, to which is added, in

small portions at a time, a solution of 29 Gm. of sodium peroxide in 1,500 Cc. of water. No mercury is lost by this process, and the metal is purer than if it had been distilled in a vacuum.—Chem. News, April 3, 1908, 158.

*Mercury—Rapid Volumetric Estimation as Iodate.*—His attention having been called accidentally to a reaction between a soluble mercuric salt and iodic acid, resulting in the formation of a practically insoluble mercuric iodate, which settles rapidly, Linwood A. Brown conceived the idea that the reaction might prove useful for the volumetric estimation of mercury. On being precipitated from solutions slightly acidulated with acetic or nitric acid, mercuric iodate comes down as a white, curdy precipitate, resembling silver chloride. It settles rapidly, and is easily washed. It can be dried at a temperature of  $110^{\circ}$  to  $135^{\circ}$  C., without decomposition, or the iodine may be liberated and titrated with decinormal solution of thiosulphate according to the following reaction:  $\text{Hg}(\text{IO}_3)_2 + 10\text{KI} + 12\text{HCl} = \text{HgCl}_2 + 10\text{KCl} + 12\text{I} + 6\text{H}_2\text{O}$ . The author describes the volumetric method in detail and recommends it as offering many advantages, both in speed and accuracy, over those commonly employed in estimating mercury, either volumetrically or gravimetrically.—Merck's Rep., March, 1908, 57-58.

*Ammonium Amalgam—Constitution and Characters.*—George McPhail Smith's experiments have shown that LeBlanc's conclusion that ammonium amalgam is a compound of mercury with the metallic radical  $\text{NH}_4$  is the correct view of its constitution, and that the assumptions of Moissan that it is a compound of ammonia and mercury hydride, and of Rich and Travers that it is free ammonium dissolved in mercury, are both untenable. Moissan based his view upon the fact that sodium amalgam containing sodium hydride reacts with aqueous ammonia with increase of volume, while sodium amalgam alone gives hydrogen at constant volume with the same liquid. The author repeated Moissan's experiments with some modifications, and found that although sodium amalgam does not increase in volume with aqueous ammonia, other amalgams do, and sodium amalgam itself swells up with ammonium salt solutions. Also at a lower temperature the  $\text{NH}_4$  of the ammonium hydroxide present in the solution is capable of expelling sodium from its amalgam. Moreover, it has been found that in the form of their amalgams the alkali and alkaline earth metals are mutually replaceable, and since ammonium amalgam also possesses this property it must be regarded as a true analogue of potassium amalgam. There is no ground for Rich and Travers' assumption that ammonium amalgam is a simple solution of free ammonia in metallic mercury, and their experiments only show that the general formula of the amalgam is  $\text{NH}_4\text{Hg}_m$ . Cryoscopic measurements cannot determine  $m$ , and there is no reason for thinking that it is equal to 0. Indeed, Moissan and Ruff's failure to isolate free ammonium at very low temperatures

argues against this assumption. The author's experiments all go to show that ammonium amalgam is a compound of the formula  $\text{MeHg}_m$ , dissolved in free mercury. This compound,  $\text{NH}_4\text{Hg}_m$ , is very unstable; at  $0^\circ \text{C}$ . it decomposes slowly, and more quickly at room temperature into hydrogen, ammonia and mercury. The gases are retained by the mass, and cause the characteristic swelling-up, which, however, is not a property of the original compound, but is only an incidental phenomenon of its decomposition.—Chem. News, Aug. 2, 1907, 60; from Ber. d. D. Chem. Ges., 40 (1907), No. 10.

*Mercurous Chloride—New Method of Preparation.*—C. Yamanto proposes a new method of preparing calomel, which consists essentially in heating a mixture of mercury, ferric oxide and "bitter-lye" (the mother liquor from common salt, composed principally of magnesium chloride) in an earthenware pot. The calomel sublimes from this mixture in well-formed crystalline scales, which on a single washing with water is completely freed from corrosive chloride.—Pharm. Ztg., liii (1908), No. 47, 468; from Journ. Pharm. Soc. of Japan, 1908, No. 314.

*Mercuric Bi-bromide—Preparation, Characters and Compounds.*—The modern use of mercuric bi-bromide in syphilis, both internally and by injection, has induced Vicario to investigate the methods for its preparation and therapeutic exhibition. He finds the method depending on the direct action of bromine upon mercury in the presence of alcohol to be wasteful and accompanied by the loss of much bromine. It is therefore better to allow the reaction to take place in the presence of water, purifying the product by subsequent crystallization from alcohol and, finally, by sublimation. In this way it is obtained in form of lamellæ, which are further distinguished from mercuric chloride by their sparing solubility in water, alcohol and ether, by the development of bromine in contact with chlorine water, and by not yielding a precipitate on addition of potassium chromate to their solution. The presence of mercuric bromide is detected by the black color produced on addition of ammonia or alkalis. Its aqueous solution must be prepared without heat, mercuric bromide being reduced to yellow mercurous oxybromide by heat and hydrobromic acid formed. The cold aqueous solutions, owing to the sparing solubility of the mercuric salt, are best made with the addition of sodium bromide or sodium chloride in the proportion of 1 mol. of the mercuric bromide to 2 mol. of the sodium salts. The double salts ( $\text{HgBr}_2 \cdot 2\text{NaBr}$  and  $\text{HgBr}_2 \cdot 2\text{NaCl}$ ) thus produced form stable solutions of neutral reaction, which may be sterilized at  $120^\circ \text{C}$ . without decomposition.—Pharm. Ztg., lii (1907), No. 89, 933; from Rép. de Pharm., 1907, No. 10.

*Sodium Dibromomercurate—A New Compound Recommended for Medicinal Use.*—Dalimier calls attention to a new soluble mercury-sodium compound,  $\text{HgBr}_2 \cdot 2\text{NaBr}$ , which is recommended for medicinal use in the

form of solution for injection. The solution is best prepared by dissolving 1.80 Gm. of mercuric bromide and 1.40 Gm. of crystalline sodium bromide, containing 2 mol.  $H_2O$ , in sufficient distilled water to make 100 Cc.—each Cc. of this solution containing 0.01 Gm. of mercury. It is neutral, readily absorbed, and analgesic when injected, so that a dose of 1 Cc. is painless. The solution is quite stable, and may be sterilized at  $120^{\circ} C.$ —Pharm. Journ., July 13, 1907, 43; from Journ. de Pharm. et Chim., 26 (1907), 43.

*Hydrargyri et Potassii Iodidum, Br. Ph. Codex—Criticism of Formulas and Composition.*—In the B. P. Codex a salt is described under the name of Hydrargyri et Potassii Iodidum, to which, as prepared by methods indicated, the formula  $Hg_2K_2I_6 \cdot 3H_2O$  is assigned, and which is described as occurring in yellow prismatic crystals, soluble in water, alcohol and ether. W. A. H. Naylor and E. J. Chappel have endeavored to obtain a salt of the composition indicated, and communicate the character and results of their experiments which lead them to the following conclusion: That the salt prepared by the first of the "Codex" methods does not correspond in composition with the formula  $K_2Hg_2I_6 \cdot 3H_2O$ , that it is not a definite chemical compound, but that it contains an admixture of potassium iodide; that it is not completely soluble in ether; and that the statement regarding its solubility in water is only partly correct. Furthermore, since by the second process salts soluble in water may result, whilst the true  $(HgI_2KI)_2 \cdot 3H_2O$  is decomposed by that liquid, these salts must contain more potassium iodide than the formula requires. The authors have however devised a method whereby a salt containing the two iodides in molecular proportions may be obtained, either by using water or alcohol as solvent, the latter being preferred: 45 Gm. mercuric iodide, 16.5 Gm. of potassium iodide, and 20 Cc. alcohol (90 per cent.) are used. Finely powder and intimately mix the two salts, and then boil the mixture with the alcohol till only traces of impurities remain undissolved; filter the solution through a hot-water funnel and allow to cool. The crystals which separate are collected and dried with as little exposure to the air as possible (small quantities are best dried in a desiccator over sulphuric acid). By slow evaporation of the mother liquor in dry air, further crops of yellow needle-shaped crystals are obtained. The solution should not be evaporated to complete dryness, as a small quantity of mercuric iodide may be liberated during the last stages of the evaporation. The salt must be preserved in well-stoppered bottles, as it is readily decomposed by moisture. The first crop of crystals obtained contains rather more of the iodide and less water of crystallization than later crops, but the difference is small, and the other part of the salt yields results in close agreement with those required for  $(HgI_2KI)_2 \cdot 3H_2O$ .—Pharm. Journ., Mar. 7, 1908, 315-316.

*Hydrargyrum Oxydatum Via Humida Paratum—Proposed Formula for*

*the G. P.*—The pharmacopœial revision committee of the Rhenish Chamber of Apothecaries proposes the following formula and process for preparing yellow mercuric oxide by the humid method, providing for its immediate incorporation into ointment: 27.1 parts of mercuric chloride are dissolved in 550 parts of warm water; the cooled solution is filtered into a mixture of 80 parts of solution of sodium hydroxide and 150 parts of water, contained in a tared porcelain mortar, and washed by subsidence and careful decantation until a chlorine reaction is no longer obtained. The precipitate is then freed from excess of water by absorption with a strip of filter-paper until its weight is reduced to 60 parts, and it is then incorporated by trituration with 40 parts of anhydrous wool-fat and 100 parts of white American vaselin, to make 200 parts of ointment. Allowing a loss of 1.6 parts of mercuric oxide by the washing, the finished ointment contains 10 per cent. of this medicament. It must be protected from light.—Apoth. Ztg., xxiii (1908), No. 18, 179.

*Mercuric Peroxide—New Method of Preparation.*—Referring to the work of Bredig and Antropow (see Proceedings, 1907, 856), Giovanni Pellini gives the following new method for preparing mercuric peroxide,  $\text{HgO}_2$ : 5 Cc. of an alcoholic solution of mercuric chloride (32 Gm. to 100 Cc.) are mixed with 10 Cc. of 30 per cent. hydrogen dioxide; the mixture is diluted with a little alcohol, cooled to  $0^\circ \text{C}$ ., and the necessary quantity of alcoholic potassium hydroxide for complete precipitation is added. The yellow precipitate at first formed becomes red on shaking; it is then washed with ether and cooled to  $0^\circ \text{C}$ . So obtained, mercuric peroxide forms a brick-red, amorphous mass, which is decomposed by water, splitting off oxygen, and forming hydrogen dioxide and mercuric oxide. It dissolves readily in acids with formation of mercuric salts and hydrogen dioxide.—Apoth. Ztg., xxii (1907), No. 94, 1022; from Atti. R. Accad. de Linc., 1907, 408.

#### LEAD.

*Minium—Improved Method of Examination.*—The G. P. III method for the examination of minium directed the use of sugar as reducing agent, which, although somewhat tedious, was fairly satisfactory. The G. P. IV directs the use of oxalic acid instead of sugar, but this has been found by K. Dieterich to be not only more tedious, but to yield unreliable results. Discussing this subject, A. Partheil points out that the oxalic acid method is perfectly worthless, since it results in the formation of more or less insoluble precipitates of lead oxalate, which are variable in composition, and to the extent of their presence increase the amount of undissolved residue, which should not exceed 0.035 Gm. from 2.5 Gm. of minium. He finds lactic acid to be the most efficient reducing agent, giving practically accurate results with greater expedition than is possible with sugar as reducing agent, and recommends the following method for

inclusion in the next Pharmacopœia: Place 2.5 Gm. minium in a wide-mouthed Erlenmeyer flask of about 200 Cc. capacity, add 10 Cc. water, 5 Cc. lactic acid and 10 Cc. nitric acid (25 per cent.), and carefully rotate the contents of the flask. In a short time (1 to 2 minutes in the case of good samples of minium) the solution of the minium is completed, with lively evolution of carbon dioxide and acetaldehyde; the undissolved portion is collected on a tared filter, washed with water, dried to constant weight, and weighed. While very slightly higher results were obtained in most cases on repeating the examination of the same (51) samples by the sugar-method, the lactic acid excels in convenience and celerity. The results are given in a table showing the source, designation, percentages of residue obtained by the lactic acid- and sugar-methods respectively, and the percentages of lead peroxide ( $\text{PbO}_2$ ) determined in the samples by the method of Topf; the latter depending on the titration of iodine liberated under the conditions of the test.—Arch. d. Pharm., 245 (1907), No. 7, 519-528.

*Minium—Use of Hydrogen Dioxide for Its Examination.*—According to E. Pieszczyk, hydrogen dioxide is preferable to oxalic acid as a reducing agent in the method of examination directed by the G. P. IV. He finds that in the presence of nitric acid, lead peroxide and hydrogen dioxide are mutually decomposed with formation of lead oxide, water and oxygen in molecular proportions, the latter being eliminated with effervescence, while the yellowish lead oxide dissolves in the acid with production of a colorless solution.—Pharm. Ztg., lii (1907), No. 88, 922.

*Minium—Examination.*—Dr. J. F. Sacher, although conceding that the method of examination of minium proposed by Pieszczyk yields satisfactory results, suggests (in Chem. Ztg., 1908, No. 6), that after treatment with nitric acid the acid be completely evaporated, so that any lead present as sulphate may not be retained in solution and thus escape detection; and, furthermore, that formaldehyde be employed in place of the hydrogen dioxide recommended for the reduction of the lead peroxide. In a rejoinder, Pieszczyk observes that the presence of lead sulphate in minium is a remote contingency, and may well be neglected, the more particularly since the complete evaporation of the nitric acid gives rise to copious and inconvenient vapors in the laboratory. With regard to formaldehyde as a reducing agent this, it is true, promptly effects the reduction of lead peroxide; but the reaction is so violent and stormy, almost explosive, that it becomes difficult to avoid loss and consequent vitiation of quantitative experiment. On the other hand, the reduction with hydrogen dioxide takes place smoothly, without the contingency of loss, and conforms to all practical requirements.—Pharm. Ztg., liii (1908), No. 9, 87.



## THORIUM.

*Thorium Fluoride ( $\text{ThF}_4$ ) and Thorium Oxyfluoride ( $\text{ThOF}_2$ )*.—*Preparation and Properties*.—Ed. Chauvenet's experiments have determined that when thorium nitrate is precipitated with silver fluoride a gelatinous precipitate of the hydrated fluoride is obtained. It retains four molecules of water when dried to constant weight in a vacuum. When heated to  $800^\circ \text{C}$ . in a current of anhydrous hydrofluoric acid, a white oxyfluoride,  $\text{ThOF}_2$ , is obtained. The same compound can be prepared by decomposing in a slow current of hydrogen the fluosilicate of thorium obtained by precipitating a solution of thorium nitrate with hydrofluosilicic acid. Gaseous hydrofluoric acid reacts on the anhydrous bromide or iodide of thorium, giving the pure fluoride,  $\text{ThF}_4$ . Thus prepared the fluoride is amorphous, and is not attacked by sulphuric acid.—Chem. News, June 12, 1908, 288; from Compt. rend., 146 (1908), No. 19.

## BISMUTH.

*Bismuth Subnitrate—Presence of Ammonia in Commercial Samples and Test*.—J. Rutherford Hill, having observed a distinct evolution of ammonia in a powder mixture of bismuth subnitrate, sodium bicarbonate and morphine hydrochloride, tested a number of commercial samples of bismuth subnitrate, and found them also contaminated with ammonia (nitrate), although not to the same extent. Nevertheless, some of these samples would have passed muster if the odor had simply been depended on for its recognition as described in the U. S. P. test (the B. P. does not give a test), and he regards it desirable that a more stringent test than one depending on the odor should be adopted. By using 1 Gm. of subnitrate and 2.5 Cc. of a 50 per cent. solution of KOH (and boiling? Rep.) the evolution of ammonia was quite distinct, and gave a pronounced reaction with moistened red litmus paper (subjected to the vapor) with samples which would have passed muster with the U. S. P. test. The author suggests this more stringent test for inclusion in the B. P.—Pharm. Journ., Febr. 22, 1908, 221.

*Light Bismuth Subnitrate—Superiority over the Heavy Variety*.—Following up the investigations of Mr. Hill (see preceding abstract), Edward J. Brown has made a series of experiments with results which point out the comparative freedom of the light variety of bismuth subnitrate from ammonium salt. This is ascribed to the fact that in the manufacture of the light variety considerably more water is used in the precipitation than that given in the B. P., 1885, resulting also in a greater lessening of the action of the nitric acid, and consequently in the formation of a product of greater basicity. All investigators gave results conforming to the formula  $\text{Bi}_2\text{O}_3\text{HNO}_3$  for this light variety, which should be adopted in the next edition of the B. P. in place of the heavy variety which corresponds to the formula  $\text{BiONO}_3\text{H}_2\text{O}$  now given.—Pharm. Journ., Mar. 21, 1908, 378-379.

## VANADIUM.

*Hypovanadic Acid—Isomeric Hydrates.*—Hydrated hypovanadic acid,  $V_2O_4 \cdot 2H_2O$ , is red, but loses its color when kept from contact with the moisture of the air, and becomes olive-green. According to Gustave Gain, this change is not due to hydration, as it takes place in the perfectly dry acid, and it seems probable that the two hydrates are isomeric modifications. Moreover, the isomeric transformation persists in the salts which are obtained from the two forms. It is, however, possible to get to the same final state by adding to a solution of the sulphates the theoretical quantity of caustic potash necessary to saturate the sulphuric acid in the liquid. The liquid is then decolorized, potassium hypovanadate being formed, and it is no longer possible to distinguish between the two forms.—Chem. News., April 10, 1908, 179; from Compt. rend., 146 (1908), No. 8.

## CHROMIUM.

*Chromium—Characteristic Reaction.*—F. H. Alcock observes that the newer method of separating iron, chromium and aluminum in qualitative analytical work, which depends on the precipitation of ferric iron by sodium hydroxide solution, and adding to the filtrate sodium peroxide, which transforms the chromium hydrate into chromic acid, affords a very characteristic qualitative test for chromium if the oxidation of the chromium is not carried to completion, and a little diluted acetic, nitric, hydrochloric, or sulphuric acid be added. Under these conditions (using acetic acid preferably) a beautiful deep violet or blue or purple color is produced, the whole operation being conducted without the aid of heat.—Pharm. Journ., Aug. 10, 1907, 211.

*Chromic Anhydride, B. P.—New Acidimetric Test.*—There are well-known processes by which chromic acid anhydride can be valued in terms of its oxidizing power, but there is no method for determining it acidimetrically. T. E. Wallis reports work done in that direction, and as a result recommends the following acidimetric test for inclusion in the B. P., which he has found quite reliable: To 0.1 Gm. of chromic anhydride add 3 Cc. of solution of barium chloride and 3 Cc. of solution of sodium acetate; filter, and using phenolphthalein as indicator, titrate the filtrate with decinormal solution of sodium hydroxide, of which not less than 19.8 Cc. should be required. This would indicate a purity of at least 99 per cent.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1907, 381-387.

*New Chromium Sulphate—Conditions of Formation and Properties.*—Paul Nicolardot finds that when a solution containing 10 per cent. of violet chromium sulphate is boiled, barium carbonate is added, and the liquid filtered, a substance having the formula  $(Cr_2O_3)(SO_3)_{2.5}(H_2O)_{7.5}$  is found in the filtrate. This sulphate dissolves easily in water with a slight

evolution of heat. The solution is not precipitated by barium chloride nor by sodium phosphate, and thus the substance does not behave either like a sulphate or a salt of chromium. It is precipitated from aqueous solutions by the addition of alcohol or acetone. The aqueous solutions are faintly acid, and are green in color. As regards the complete repression of the  $\text{SO}_4$  ion, this sulphate resembles the green sulphate  $(\text{Cr}_2\text{O}_3)(\text{SO}_3)_2(\text{H}_2\text{O})_8$ , prepared by Recoura.—Chem. News, Jan. 24, 1908, 46; from Compt. rend., 145 (1907), No. 26.

## MANGANESE.

*Permanganic Acid—Isolation and Characters.*—According to M. P. Muir, free permanganic acid, in form of about 17 per cent. solution, may be obtained by decomposing a solution of barium permanganate with an equivalent quantity of diluted sulphuric acid, filtering the solution through glass wool, and evaporating the filtrate in a vacuum over sulphuric acid. If then this 17 per cent. solution is exposed in an open vessel, a mixture of brown manganese oxides, of variable composition, and blue-violet crystals of permanganic acid are deposited on standing. Absolutely pure acid was, however, not obtained. The author finds that very dilute solutions of permanganic acid may be boiled without decomposition; 4 per cent. solutions show evidence of decomposition very soon after boiling by the separation of a brown substance on the surface, whilst more concentrated solutions are decomposed gradually at the ordinary temperature with evolution of ozonized oxygen. On evaporation *in vacuo* a nearly pure residue of  $\text{MnO}_3$  is obtained.—Pharm. Ztg., lii (1907), No. 98, 1021; from Chem. Centralbl., 1907, ii, No. 19.

## IRON.

*Reduced Iron—Methods of Assay.*—G. Frerichs reviews the methods for determining the metallic iron in reduced iron adopted in modern pharmacopœias. These are mainly based on three reactions: with mercuric chloride, with iodine, and with copper-sulphate. The first two give very variable results and are unsuitable; the copper-sulphate method is better, but the proportion of copper-sulphate prescribed by the B. P., 1898, is insufficient. Using 0.3 Gm. of reduced iron and 1.5 Gm. of copper-sulphate, however, fairly concordant results are obtained. In distinction from all the other pharmacopœias, the Netherlands Pharmacopœia, (1905), considers it sufficient to determine the total iron in the sample, and thus to estimate the percentage of metallic iron present. This *total iron* should not be below 96.6 per cent. The determination would be effected by dissolving 1 Gm. of the reduced iron in hydrochloric acid, oxidizing with nitric acid, precipitating with ammonia, igniting and weighing as ferric oxide, which should not be less than 1.38 Gm. Allowing 1 per cent. of insoluble residue and 9 per cent. of  $\text{Fe}_2\text{O}_3$ , the re-

mainder would be the metallic iron (90 per cent.) in the sample.—Arch. d. Pharm., 246 (1908), No. 3, 190-205.

*Ferrum Pulveratum, Phar. Nederl.*—*Test for Copper.*—H. Kerbosch finds that the test of the Pharm. Nederl. for the detection of copper in powdered iron, which is similar to that of the G. P. IV, suffers from the defect that some of the copper present may escape detection. This test is made by dissolving the iron in 10 p. of diluted hydrochloric acid, oxidizing the solution with nitric acid and then precipitating with ammonia. The filtrate should be colorless and should leave no residue on evaporation. The test is available for the detection of 0.1 per cent. of copper in the sample, but suffers in delicacy from the fact that diluted hydrochloric acid does not dissolve all of the copper present in the iron. If the residue remaining after dissolving the powdered iron in diluted hydrochloric acid and washing with water is treated with warm, diluted nitric acid, the solution treated with ammonia in excess, and then filtered, the filtrate will exhibit a distinct blue color if copper was present in the iron.—Pharm. Ztg., lii (1907), No. 71, 740; from Pharm. Weekbl., 1907, No. 34.

*Iron—Volumetric Determination in Ferric Compounds.*—M. M. Pattison Muir finds that in reducing ferric compounds to the ferrous state by means of zinc and sulphuric acid, not only must the iron be completely reduced, but the whole of the zinc must be dissolved before titration with standard potassium permanganate solution. If very little zinc be used, reduction takes place very slowly, while if much be used it takes a considerable time to dissolve. It has been observed that an aqueous solution of mercuric chloride arrests the reaction between zinc and warm dilute sulphuric acid, mercury being precipitated on the zinc. This reaction may be utilized for the volumetric determination of iron in ferric compounds thus: A measured volume of the solution of the ferric compound is placed in a flask fitted with a cork which carries a glass tube narrowed at its upper end; about 200 Cc. of dilute pure sulphuric acid and about 20 Gm. of granulated zinc, free from iron, are added; the liquid is warmed until there is brisk evolution of hydrogen, and the flask is shaken from time to time until reduction is complete. About 100 Cc. of a nearly saturated aqueous solution of mercuric chloride is now added; the flask is shaken for three or four minutes, and then cooled. A standard solution of potassium permanganate is now run in until a faint pink color is obtained. In determining iron in solutions containing from 0.005 to 0.01 Gm. of ferric iron per Cc., and using 25 Cc. of such solutions, a determination may be performed in rather less than half an hour.—Chem. News., Jan. 31, 1908, 50.

*Iron—A New and Very Sensitive Reaction.*—O. Lutz finds that if an aqueous solution of protocatechuic acid be added to a liquid containing a minute trace of iron and then a few drops of normal sodium carbonate

solution, to impart a slight alkalinity, a red color will be developed. The reaction is obtained thus, in the presence of alkali, with both ferrous and ferric salts. It is sufficiently sensitive to detect 1 part of Fe in a dilution of 10,000,000. In acid solution ferric salts give a bluish-green color with protocatechuic acid, but ferrous salts do not react. This color reaction in alkaline solution does not appear to be affected by the presence of other salts, such as interfere with some other reactions of iron.—Pharm. Journ., Mar. 28, 1908, 413; from Chem. Ztg., 1907, 570.

*Iron*.—Frank R. Eldred and C. M. Pence communicate a paper on the estimation of iron in scale salts, in the "Proceedings" of this Association, 1907, 364-368.

*Masked Iron—A Series of Complex Salts*.—P. Pascal describes a number of complex salts of iron in which the iron is masked. When freshly precipitated ferric pyrophosphate is added to a solution of sodium pyrophosphate, the solubility of the ferric salt is independent of the temperature and of the concentration of the sodium salt. When the solution is saturated the constituents are present in the proportion  $(P_2O_7)_3Fe_4 : 3P_2O_7Na_4$ . The iron in this solution does not give the ordinary iron reactions except as regards reducing agents, *e. g.*, oxalic acid, ammonium hydrosulphide. Thus, a new complex, to which the author has given the name

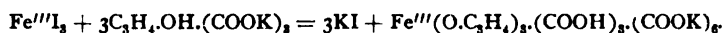
*Ferripyrophosphate*, appears to be present. The sodium salt has the formula  $Fe_4(P_2O_7)_3Na_4 \cdot 9H_2O$ . A ferropyrophosphate,  $Fe_2(P_2O_7)_2Na_6$ , can be prepared by using metaphosphoric instead of pyrophosphoric acid. Furthermore, the author describes a new series of

*Ammonio-Ferric Salts in which the Iron is Masked*.—When ammonia is added to a solution of ferric pyrophosphate the liquid is colored red, and a crystalline precipitate forms. Where the two liquids meet a layer of a red substance, with light yellow masses above it, can be detected, and in the upper part of the liquid long silky crystals are formed. All these substances are ammoniacal ferric salts in which the iron is masked. The crystalline precipitate contains sodium pyrophosphate, precipitated by the ammonia, and varying proportions of ammonia and iron. The ratio of the iron to the ammonia is fixed, and when excess of ammonia is present the precipitate may be regarded as formed of a combination of sodium phosphate and ferric pyrophosphate of formula  $n(P_2O_7Na_4 \cdot 10H_2O) + Fe_2(P_2O_7)_2Na_6 + 3NH_3 + pH_2O$ .—Chem. News, March 20, 1908, 142; from Compt. rend., 146 (1908), Nos. 5 and 6.

*Citro-Compounds of Iron* are critically examined by A. B. Stevens in the "Proceedings" of this Association, 1907, 153-155.

*Citro-Compounds of Iron—Position of the Iron*.—Referring to the above-mentioned paper of A. B. Stevens, J. E. Gerock (Strassburg-Neudorf), discusses the position of iron in the so-called citro-iodide of iron, from

which he concludes that the reaction involved in the process of preparation may be described as follows: The ferrous iodide dissolves a third atom of iodine, and whether it combines with it in a strictly chemical sense or not, now acts like ferric iodide, the iron being trivalent. Citrate of potassium being added, double decomposition may be regarded as taking place with the formation of potassium iodide. The ferric iron, however, does not take the place of the displaced potassium, but steps into the places of hydroxyl hydrogens, whereas these in turn step into the places of potassium, reconstructing the carboxyl groups. The result is a complex molecule, the several citric radicals being held together by the ferric iron. The simplest phase of this reaction can possibly be expended by the following equation, although practically the reaction may be regarded as more complex.



In a rejoinder to the above, Mr. Stevens mentions that his paper referred to by Mr. Gerock was directed to a consideration of the method of preparation, rather than the chemical nature of the resulting compound. He considers the theory advanced by Mr. Gerock very plausible, but submits that the formula given calls for three molecules of citrate to one atom of iron in the ferric condition. Since citric acid has only one hydroxyl group it is difficult to see how ferric iron can unite with less than three of the citrate, unless part of the iron is combined with some of the carboxyl groups. The amount of citrate actually required for each atom of iron is half that required by Gerock's formula. By replacing the hydrogen in his three carboxyl groups with iron, the reaction would be as follows:  $\text{Fe}(\text{C}_3\text{H}_4\text{O})_3(\text{COOH})_3(\text{COOK})_6$  becomes  $\text{Fe}(\text{C}_3\text{H}_4\text{O})_3(\text{COO})_3\text{Fe}(\text{COOK})_6$ , which is the proportion actually required.—Pharm. Rev., May, 1908, 129-131.

*Ferrous Carbonate—Determination in the Presence of Sugar, etc.*—P. H. Crewe has communicated several papers on the determination of ferrous carbonate in its admixtures with sugar and other organic matters, such as in saccharated ferrous carbonate, pilula ferri, etc. In the case of saccharated ferrous carbonate, discordant results are obtained in following the B. P. directions, which are due to the cane sugar undergoing inversion when treated with an acid. This is avoided as far as possible in the following method which is recommended by the author: To 1 Gm. of the saccharated ferrous carbonate, add 10 Cc. of cold 50 per cent. phosphoric acid (equal volumes of B. P. concentrated and water). Allow to stand for fifteen minutes, stirring at intervals; then dilute to 70 Cc. with water and titrate with decinormal potassium dichromate.

In the case of pilula ferri, the author says that the excipients influence the determination in this and other formulas, particularly the glycerin and honey. This difficulty may be overcome by a method based on the fact

that when hydriodic acid is added to a ferric salt, iodine is liberated, and the iron is reduced to the ferrous state. Full particulars of the method are given. In a third paper, the author makes a comparison of the influence of certain organic matters on solutions of potassium permanganate, and dichromate for the determination of ferrous carbonate. In some cases a much larger volume of dichromate than permanganate is required, whilst in others the reverse holds good; in some, permanganate is much to be preferred to dichromate. Trans. Brit. Pharm. Conf., (Yearbook of Pharm.), 1907, 458-468.

*Ferrous Sulphate—Satisfactory Commercial Quality.*—Otto B. May has examined samples of the different grades of ferrous sulphate supplied by the largest American producers of this salt, and found that none of the samples responded to the time-limit test for foreign metals. The samples examined were taken from large lots, representing what is known in the general trade as "Bottom Crystals"; consisting of brown-colored, oxidized, irregular-sized crystals, such as are sold for technical uses only; "prime green," bright, clean and large crystals; and "sugar sulphate," a slightly effloresced granular powder, corresponding to ferri sulphas granulatus, U. S. P.—Amer. Journ. Pharm., May, 1908, 211.

## NICKEL.

*Nickel—Sensitive Method of Separation from Cobalt.*—Pozzi-Eskot recommends a highly sensitive method for the identification of nickel in the presence of cobalt, which depends upon the insolubility of nickel molybdate, produced in neutral or acid aqueous solutions of a nickel salt by alkali molybdate in excess, while cobalt molybdate is very soluble under the same conditions. The method is convenient and accurate. So, for example, the presence of 0.01 Gm. of nickel was very accurately determined in its admixture with 5.0 Gm. of cobalt, the determination being effected in a few minutes.—Pharm. Ztg., lii (1907), No. 89, 933; from Chem. Ztg., 1907, No. 81.

## MOLYBDENUM.

*Molybdenum—New Color-Test.*—On adding hydrogen dioxide to an aqueous solution of ammonium molybdate, rendered faintly alkaline with ammonia, with the object of converting the lower oxide of molybdenum into molybdate, William Bettel obtained, instead of the expected blue color, an intense brownish-red color (slightly redder than the color produced by the Nessler test in weak ammonia solutions). This color, which has not heretofore been mentioned in the literature, he attributes to the formation of a permolybdate. The color is partly discharged by dilution, and disappears on standing, oxygen being cooled, but is instantly discharged by addition of excess of alkali. The color reaction is produced in solutions of alkaline molybdates if quite neutral or containing a mere

trace of free alkali. It is quite sensitive, giving a strong reaction with 0.00005 Gm.  $\text{MoO}_3$ , distinct with 0.000005 Gm., and very faint, but unmistakable, with 0.000001 Gm. of the acid, and therefore serves as a good indicator of neutrality when forming neutral solutions of molybdates. The test for molybdate may be carried out as follows: The solution is evaporated nearly to dryness, tested for neutrality by litmus; if alkaline, neutralized by nitric or sulphuric acid and solution of hydrogen dioxide added. If a yellow color is observed, a small drop of dilute ammonia is added; the brownish-red color will then appear if molybdate is present.—Chem. News, Jan. 24, 1908, 40.

#### URANIUM.

*Uranyl Molybdate—A New Uranium Compound.*—Andre Lancien finds that when ammonium molybdate acts on uranyl nitrate a precipitate is formed which has the composition corresponding to the formula  $\text{MoO}_4 \cdot \text{UO}_2$ , and is therefore a molybdate of uranyl. The yield is theoretical, and in the dark an amorphous white powder is obtained. It is insoluble in water, ethyl and methyl alcohol, acetic acid, chloroform, benzene, toluene, and sulphuric ether. Ethyl and methyl alcohol and acetic acid transform it into a green uranous compound. When boiled for a long time with the bases  $\text{NH}_3$ ,  $\text{KOH}$ ,  $\text{NaOH}$  it turns brick-red, and then gives a green oxide. It dissolves quickly in  $\text{HCl}$ ,  $\text{H}_2\text{SO}_4$ ,  $\text{HNO}_3$ , and  $\text{H}_2\text{S}_2\text{O}_7$ . Its physical and chemical properties appear to change after it has been kept for thirty hours; it is then yellow in color, insoluble in  $\text{HNO}_3$ , and not reduced by ethyl alcohol. It is a radio-active substance, and its activity is about equal to that of barium bromide, and much superior to that of uranyl nitrate.—Chem. News., July 26, 1907, 48; from Compt. rend., 144 (1907), No. 25.

*Uranium Tetraiodide—Preparation and Properties.*—Marcel Guichard has prepared anhydrous uranium tetraiodide by the action of iodine vapor heated to  $180^\circ \text{C}$ ., on melted uranium in sealed vacuum tubes. It occurs in fused crystalline masses or in fine black needles, forming a felted mass in the sealed tube. It melts at about  $500^\circ \text{C}$ ., and is slightly volatile between  $500^\circ$  and  $600^\circ \text{C}$ . *in vacuo*. Its specific gravity in dry benzene is 5.6 at  $15^\circ \text{C}$ ., compared with water. Analysis shows that its composition is: Uranium, 32.06; iodine, 67.93, calculated for  $\text{UI}_4$ . It has the following chemical properties: Heated in hydrogen, it gradually gives up its iodine in the form of hydriodic acid. Chlorine decomposes it in the cold, with evolution of heat; on heating slightly, iodine trichloride sublimes and black uranium chloride remains. Heated gently in dry oxygen it takes fire, loses all its iodine and is converted into the green oxide ( $\text{U}_2\text{O}_5$ ), the same reaction being observed on heating with dry air. Exposed to the air it rapidly deliquesces, forming a brown liquid which contains free iodine. On adding an excess of water to this liquid, after



several hours, a yellow solution is obtained, which, on heating, gives a precipitate of the green hydrated oxide. Uranium tetraiodide dissolves readily in water, and when protected from oxidation gives a strongly acid green solution, which, on the addition of ammonia, yields a brown-red precipitate, while ammonium sulphide gives a brown-black precipitate, as in the case of uranous salts.—Pharm. Journ., Jan. 25, 1908; from Compt. rend., cxiv, 921.

*Ammonium Uranate—Therapeutic Use.*—Aillard and Jullien have used a 5 per cent. trituration of ammonium uranate—the so-called “Uranium Oxide” of commerce, which has hitherto been used in porcelain painting—and sterilized vaseline oil, with good results in the treatment of syphilis. One Cc. of the trituration (containing 0.05 Gm. of ammonium uranate) is injected once a week.—L'Union pharm., 1907, No. 12.

The “Pharmaceutische Zeitung,” however, explains that the uranium compound in question is  $(\text{NH}_4)_2\text{U}_2\text{O}_7$ , obtained from uranium pitch-blend and is a yellow powder, sparingly soluble in water, which must not be confounded with the “uranium yellow” of commerce, this being sodium uranate  $(\text{Na}_2\text{U}_2\text{O}_7)$ . The latter can be used for making ammonium salt.—Pharm. Ztg., liii (1908), No. 3, 26.

#### RADIUM AND DERIVATIVES.

*Radium—Redetermination of Atomic Weight.*—Having secured an adequate supply of radium chloride, Mme. Curie has made a redetermination of its atomic weight, and concludes this to be 226.2 ( $\text{Ag} = 107.8$ ,  $\text{Cl} = 35.4$ ), with a probable error of less than half a unit.—Chem. News, Sept. 13, 1907, 127; from Compt. rend., 145 (1907), 422.

T. E. Thorpe communicates in great detail his investigations on the atomic weight of radium, undertaken independently and partly concluded before he became aware of the recent determination of Mme. Curie. The results now obtained show a mean value of 226.7, or, to the nearest unit, 227, and thus proves to be in close accord with Mme. Curie's latest number. He, therefore, considers it to be reasonably well established that the atomic weight of radium is now known to within a unit, which, considering the relatively high number, is, under the present circumstances, as fair a degree of exactitude as could be anticipated.—Chem. News, May 15, 1908, 229–233.

*Radium—Separation from Radio-Lead.*—B. Szilard has studied the conditions in which it is possible to separate radium D, E and F from radio-lead when the latter undergoes certain chemical reactions. The re-crystallization of the nitrate in a neutral solution separates the polonium (radium F) which remains in the solution, but has no effect upon the radium D and E which remain in the crystals. In an acid solution radium E is left in the solution. With the chloride the same separation is effected

rapidly and completely. When radio-active lead carbonate is dissolved in concentrated sulphuric acid, and the filtered liquid is evaporated to dryness, the quantity of radium D in the residue is greater than that corresponding to the radio-active equilibrium of the radium E and F present. Nevertheless, there is only a slight concentration of the radium D in the product. Commercial urea gives a precipitate which contains a large part of the radium E and F in the solution but very little radium D, and ammonium carbonate gives the same result. These and other results show that it is easy to concentrate radium F, but much more difficult to concentrate radium D.—Chem. News, Mar. 6, 1908, 119; from Compt. rend., 146 (1908), No. 3.

*Ionium—A New Radio-Active Body.*—Occupied with experiments to determine the proportion in which radium and actinium are contained in the ores of uranium, W. Markwald and B. Keetman have come upon a hitherto unknown radio-active constituent of these ores, which is obviously identical with the substance, allied to thorium, recently discovered by B. B. Boltwood and by O. Hahn, for which Boltwood proposed the name "ionium." The uranium ores used were Joachimsthal pitchblende, crystallized pitchblende from German East Africa, and autunite. According to the interesting observations of Boltwood and Hahn, ionium seems to be the long-sought intermediate product between uranium or uranium X and radium.—Chem. News, Febr. 14, 1908, 75; from Ber. d. D. Chem. Ges., 41 (1908), 49.

*Polonium—Preparation and Behavior.*—F. Giesel observes that polonium being now known to be a derivation (a decay product) of radium, radium salts, if they are old enough, must be the best and purest material for its preparation. As a matter of fact, even before he knew of this relation, he had succeeded in precipitating polonium from pure radium solutions on metallic bismuth or platinum. Later, he obtained polonium by precipitation with hydrogen sulphide. The invisible precipitate is retained by filter paper, which then shows the effect of the best polonium. The author describes the process by which he has now prepared it in larger quantities resorting to the lead chloride from pitchblende. The new precipitate is more active than deposits of polonium on metals. It is specially noteworthy that it causes strong ozonization of the air with luminescence, besides bright phosphorescence of the zinc sulphide screen. This shows clearly the great purity of the preparation, as otherwise the  $\alpha$ -particles could not appear in quantity. The paper near the precipitate is decomposed in a few days in such a way that the deposit can easily be removed with a knife. With two or three drops of hydrochloric acid a yellow-brown solution is obtained, like platinum chloride, which becomes colorless when an oxidizing agent (nitric acid or hydrogen peroxide) is added.—Chem. News., May 22, 1908, 242–243; from Ber. d. D. Chem. Ges., 41, (1908), 1059.

*Radio-Active Minerals—Lithium a Decomposition-Product of Copper by Radium Emanation.*—Sir William Ramsay and Alex. Cameron do not think that lithium is the sole product obtained when salts of copper are treated with radium emanation, but that its presence can be explained only by supposing that such a change takes place. They have observed that the weight of the alkaline residue obtained is greater after than before treatment with the emanation, and that the spectrum of the residue shows the yellow sodium lines, and the potassium spectrum is also visible. Hence they are convinced that the decomposition of copper yields members of its group, *i. e.*, the alkaline series, and lithium is the most probable product. The sodium and potassium might be derived from the glass, and experiments to decide this question are in progress. The proportions of the products may depend upon unknown circumstances. It is possible that lithium is not a constant product of the action of the emanation on copper salts, but that the presence of other metals may determine its formation.—Chem. News, April 10, 1908, 179; from Compt. rend., 146 (1908), No. 9.

*Radio-Active Minerals—Presence of Lithium.*—Mlle. Gleditsch has determined the amount of lithium in certain radio-active minerals spectroscopically by comparing the intensity of lithium lines in the residue, after dissolving the mineral and separating the other constituents, with the intensity of the corresponding lines in artificial mixtures containing lithium. The results obtained were as follows:

	Copper, per cent.	Lithium, per cent.	Activity referred to uranium.
Joachimstal pitchblende .....	1.2	0.00017	1.5
Colorado pitchblende. ....	0.15	0.00034	1.75
Carnotite.....	0.15	0.30	0.52
Cornwall chalcocite .....	6.54	0.00011	2.0
Autunite ....	—	0.00083	1.48
Thorite .....	Trace	0.0033	0.59

The relatively large amount of lithium in carnotite is interesting, especially as the mineral contains but little copper. The results obtained do not contradict Ramsay's theory of the transformation of copper into lithium, though they do not support it; they show, however, that there is no simple ratio between the copper and lithium in radio-active minerals. Chem. News, April 3, 1908, 167; from Compt. rend., 146 (1908), No. 7.

## ARSENIC.

*Colloidal Arsenium—Preparation and Characters.*—V. Auger states that when a solution of arsenic chloride in absolute alcohol, cooled to  $-15^{\circ}\text{C}$ ., is treated with a similar solution of hypophosphorous acid at the same temperature, and the mixture is maintained below  $0^{\circ}\text{C}$ ., reduction speedily takes place, and is complete in two hours, with the formation of an ochraceous yellow precipitate. If this is collected, washed free from hydrochloric acid with alcohol, and dried *in vacuo* over sulphuric acid, it forms a red-brown powder, which has the peculiar property of being readily soluble in dilute alkalis. The solution thus obtained is a clear reddish-brown by transmitted, but turbid by reflected light. It is stable on boiling, but readily oxidized on exposure to the air, alkali arsenite being formed. Alcohol and excess of alkali precipitate brownish flocks, which are soluble in water. Acids and salts cause a precipitate, similar in appearance, but insoluble in water. The solution may be freed from all traces of alcohol by dialysis, but it persistently retains traces of phosphorus. It remains to be seen if the presence of this trace of phosphorus is necessary to render the modified arsenum soluble in dilute alkali. The original brown powder had the following centesimal composition: Arsenum, 68.2; phosphorus, 0.9; alcohol, 2.5; water, by difference, 28.4. It is immediately oxidized on contact with water.—Pharm. Journ., Dec. 14, 1907, 783; from Compt. rend., 145 (1907), 718.

*Hydrates of Arsenic Acid—Dissociation.*—According to M. Auger, the hydrate of arsenic acid,  $(\text{AsO}_4\text{H}_3)_2\text{H}_2\text{O}$ , possesses an appreciable dissociation tension below  $0^{\circ}\text{C}$ ., and loses water even at  $-10^{\circ}\text{C}$ . At about  $12^{\circ}\text{C}$ . this loss of water ceases with the formation of the hydrate  $\text{As}_3\text{H}_{10}\text{O}_8$ , or  $\text{As}_2\text{O}_7\text{H}_4\cdot\text{AsO}_3\text{H}$ . Above  $12^{\circ}\text{C}$ . and up to  $148^{\circ}\text{C}$ ., the composition of the hydrate obtained in a desiccating medium approximates closely to  $\text{As}_3\text{H}_{10}\text{O}_8$ . This is dehydrated completely between  $180^{\circ}$  and  $440^{\circ}\text{C}$ ., and above  $440^{\circ}\text{C}$ ., it begins to lose oxygen.—Chem. News, May 15, 1908, 239; from Compt. rend., 146 (1908), No. 11.

*Arsenic Acid—Determination as Such in Urine.*—Dr. M. Tonegetti has experimented with the method recommended several years ago by Filippi for the detection of arsenic acid as such in urine, which depends on the complete precipitation of the acid by means of a solution composed of 15 Gm. of barium chloride, 20 Cc. of ammonia water, and 80 Cc. of water. The results of Tonegetti's experiments lead him to the conclusion that the method is not available for the purpose recommended by Filippi, since neither arsenic acid nor arsenous acid is precipitated under its provisions, or at best, only in very small quantities. Moreover, to obtain a precipitate with arsenic acid at all, the reagent must be prepared in different proportions.—Apoth. Ztg., xxii (1907), No. 89, 962; from Bol. Chim. Farm., 18 (1907), 681.

*Arsenic and Arsenous Acids—Complete Precipitation by Baryta.*—L. Rosenthaler, referring to Tonegetti's observation, remarks that arsenous acid is quantitatively precipitated from its solutions by barium salts in the presence of sufficient ammonia, while arsenic acid is not. If, however, the hydroxyl-ions are strengthened, by using solution of sodium hydroxide in place of ammonia, then both arsenous and arsenic acid are precipitated so completely from their solutions by means of barium salts, that the filtrate will fail to give a reaction for arsenic even when subjected to Marsh's test. Reciprocally, barium may be quantitatively determined by means of arsenous acid in the presence of ammonia, or by arsenic acid in the presence of NaOH.—Apoth. Ztg., xxii (1907), No. 91, 982.

*Potassium Arsenite—Formula of the Dry Salt.*—L. Henry Bernegau calls attention to the necessity of using the right formula in assaying dry potassium arsenite. The U. S. P. (p. 590) gives the formula for potassium arsenite as  $\text{KAsO}_3$ , which is correct if we make a solution of the salt by gently heating  $\text{As}_2\text{O}_3$  with an excess of potassium bicarbonate in the presence of water, as in the case of the official liq. potass. arsen., but it is not correct for the dry salt, which has the formula  $\text{KAsO}_3 + \text{HAsO}_2 + \text{H}_2\text{O}$ . The first, taken as  $\text{KAsO}_3$ , would contain about 68.4 per cent. of  $\text{As}_2\text{O}_3$ , but the dry salt, of the second formula, contains about 72.7 per cent.  $\text{As}_2\text{O}_3$ . The dry salt, moreover, is difficult to manufacture and contains always a more or less large amount of potassium carbonate—one sample examined running as high as 35 per cent.  $\text{K}_2\text{CO}_3$  and only 38 per cent. of  $\text{As}_2\text{O}_3$ .—Amer. Journ. Pharm., Dec., 1907, 555.

*Arsin Sulphates—Compounds With the Sulphates of Potassium, Calcium and Lead.*—Hugo Kühl has succeeded in preparing compounds of the basic arsin sulphate ( $\text{As}_2\text{O}_3 \cdot 2\text{SO}_3$ ) with the potassium and calcium sulphates, and the more basic sulphate ( $\text{As}_2\text{O}_3 \cdot \text{SO}_3$ ) with lead sulphate. These compounds have the following compositions respectively:

*Potassium salt* =  $\text{As}_2\text{O}_3 \cdot 2\text{SO}_3 \cdot 2\text{K}_2\text{OSO}_3$ .

*Calcium salt* =  $\text{As}_2\text{O}_3 \cdot 2\text{SO}_3 \cdot \text{CaOSO}_3$ .

*Lead salt* =  $\text{As}_2\text{O}_3 \cdot \text{SO}_3 \cdot \text{PbOSO}_3$ .

Similar compounds of stannic sulphate, titanous sulphate, and antimony sulphate have been previously described by the author and R. Weinland. With the exception of the calcium salts of tin and antimony, these were all anhydrous.—Arch. de Phar., 245 (1907), No. 5, 377.

#### ANTIMONY.

*Stibium Sulphuratum Aurantiacum—Simple Method of Preparation.*—According to A. Sartorius the preparation of golden sulphuret of antimony may be simplified and expedited as follows: 104 p. of quick lime are slaked with 320 p. of water and the magma is added to a boiling solution of 280 p. of sodium carbonate in 1000 p. of water. Meanwhile an intimate mixture of 144 p. of black sulphide of antimony and 28 p. of sulphur

is triturated with 50 p. of water, and this magma is added in teaspoonful quantities at a time to the boiling mixture. The reaction is completed within a quarter of an hour; the product is filtered and evaporated to crystallization. From the so-called "Schlippe's Salt," so obtained, the golden antimony sulphide is then precipitated in the usual manner.—Apoth. Ztg., xiii (1908), No. 38, 342.

*Antimonium Sulphuratum, B. P.—Unsatisfactory Process.*—D. L. Howard and J. B. P. Harrison mention that, although conducting the process of manufacture of antimonium sulphuratum strictly in conformity with the B. P. directions, they have never been able to obtain a product that would satisfactorily conform to the tests of the Pharmacopœia. They find that 3 Gm. of antimonium sulphuratum will not yield 2 Gm. of residue when treated by the method laid down by the Pharmacopœia; that it is possible for a sample to contain as much as 30 per cent. of anhydrous sodium sulphate and still yield a residue figure very close to that obtained from a genuine and carefully prepared sample; and that sulphurated antimony is not readily dissolved by solution of caustic soda. They suggest suitable modifications of the official characters and tests to meet the discrepancies.—Trans. Brit. Pharm. Conf. (Yearbook of Pharmacy), 1907, 470-473.

#### SILVER.

*Nitrate of Silver—Removal of Stains on the Skin.*—The application of the following solution is said to remove the stains of silver nitrate from the skin very quickly: Mercuric chloride, ammonium chloride, aa, 10.0; distilled water, 80.0.—Pharm. Ztg., lii (1907), No. 77, 812; from D. Aertze-Ztg., 1907, No. 18.

*Silver Ammonio-Nitrate—Crystalline Form.*—N. Castoro gives the following method for preparing silver ammonio-nitrate in crystalline form: To a solution of 5 Gm. of pure silver nitrate in 4 to 5 Cc. of water strong solution of ammonia is added, so that the precipitate formed is not entirely dissolved, but a dark opalescent liquid results. This is filtered, and 120 Cc. of absolute alcohol are added to it, which causes the separation of a white precipitate of acicular crystals, having the formula,  $\text{Ag}(\text{NH}_3)_2\text{NO}_3$ , and remain unaltered for several days when kept under alcohol, but are quickly reduced on exposure to air. If ether be used as the precipitant instead of alcohol the salt is thrown down in an amorphous condition.—Pharm. Ztg., lii (1907), No. 72, 748; from Ges. Chim. Ital., 37, I, 310.

#### GOLD.

*Gold Chloride.*—A new reagent for reducing substances in *Urine*, which see under "Organic Chemistry." See also *Carbohydrates* for color reactions with chlor-auric acid.

## PLATINUM.

*Platinum—Oxidation.*—According to C. Marie, platinum appears to be much more readily oxidized at the ordinary temperature than has hitherto been believed. Thus potassium persulphate, bichromate, chlorate, and permanganate in sulphuric acid solution, and the ferricyanide and permanganate in alkaline solution, all oxidize plates of the metal. Ferric chloride in acid solution and hydrogen peroxide appear to have no action, but hot concentrated (not fuming) nitric acid oxidizes the metal. The oxide obtained ( $\text{PtO}_2$ ?) is dissociated by heat. It is soluble in hydrochloric acid, and in dilute sulphuric acid in presence of reducing agents.—Chem. News, April 10, 1908, 179; from Compt. rend., 146 (1908), No. 9.

*Platinum Silicide—Preparation and Properties.*—P. Lebeau and A. Novitzky observe that at a bright red heat a mixture of finely-divided silicon and platinum yields a compound, much heat being evolved, so that the incandescence of the mass visibly increases. Finally, an ingot looking like silicon is obtained, the polished surface of which reveals distinctly the existence of two homogeneous substances. One of these is silicon, and by the action of dilute potash the other constituent can readily be extracted. Its analysis gives the formula  $\text{SiPt}$ . This compound can be obtained in the crystalline state, and in its chemical properties it closely resembles platinum. It fuses, however, much more readily than platinum, its melting-point being about  $1100^\circ \text{C}$ . It dissolves completely in aqua regia, and is more readily attacked by oxidizing agents than platinum.—Chem. News, Aug. 30, 1907, 107; from Compt. rend., 145 (1907), No. 4.

## PALLADIUM.

*Palladium—Definite Compounds with Silicon.*—Paul Lebeau and Pierre Jolibris find that silicon and palladium combine directly with evolution of enough heat to fuse the mass when they are heated together in a porcelain crucible. By this method it is possible to obtain two compounds of silicon and palladium, corresponding to the formulæ  $\text{SiPd}_2$  and  $\text{SiPd}$ . Only the former of these has been isolated and analyzed, but the existence of both compounds is proved by the perfect agreement observed in the metallographic examination and in the determination of the fusibility curve of the system silicon-palladium. The formulæ of these silicides are comparable with those of the silicides of platinum. The study of the cooling of the silicides of palladium containing less than 20 per cent. of silicon has revealed a phenomenon of recalescence which seems to correspond to the crystallization of a supersaturated solution.—Chem. News, June 19, 1908, 297; from Compt. rend., 146 (1908), No. 20.

## RHODIUM.

*Rhodium—Study of its Halogen Salts.*—In the course of researches

undertaken with the aim to determine the atomic weight of rhodium, A. Gutbier and A. Hüttlinger have investigated the halogen salts of this element. They find that

*Sodium Hexachlor-rhodate* crystallizes with twelve molecules of water.

*Cæsium and Rubidium Pentachlor-rhodies* cannot be prepared by heating rhodium with cæsium or rubidium chloride in a current of chlorine, but may be obtained by decomposing the potassium salt, or by the direct union of soluble rhodium dichloride with the alkaline chloride. They are slightly soluble in water and contain one molecule of water.

*Potassium Pentabrom-rhodate* can be prepared by heating a mixture of very finely-divided rhodium and potassium bromide in a current of bromine. The decomposition of a solution of this bromo-salt with ammonium, cæsium, or rubidium bromide yields the corresponding brom-rhodate. These bromo-salts contain no water. The potassium and ammonium salts are fairly soluble in water, the cæsium and rubidium salts are difficultly soluble. All these rhodium compounds give up their halogen as halogen hydride when they are heated in a current of hydrogen.—Chem. News, March 20, 1908, 143; from Ber. d. D. Chem. Ges., 41 (1908), No. 2.

#### OSMIUM.

*Osmium—Quantitative Separation.*—O. Makowka finds that when a solution of acetylene saturated with acetone is added to an osmium solution, *colloid osmium* is formed and may be separated by heating the solution in a closed tube at  $100^{\circ}$ – $110^{\circ}$  C. The residue contains metallic osmium, which may readily be filtered off and is quantitative.—Chem. News, May 22, 1908, 251; from Ber. d. D. Chem. Ges., 41 (1908), No. 6.

*Osmium Peroxide—Action on Iodides.*—According to N. A. Orlov the action of osmium peroxide ( $\text{OsO}_4$ ) on potassium oxide and other soluble metallic oxides is not as has been heretofore described. The  $\text{OsO}_4$  does not liberate iodine from the aqueous solution of potassium iodide; the addition of  $\text{OsO}_4$  in aqueous solution to the neutral solution of the iodide simply develops a yellow color, and on shaking the mixture with chloroform or carbon disulphide, these liquids remain perfectly colorless. But, if then hydrochloric acid is added, a deep emerald-green color is at once developed, which is due to the formation of  $\text{OsI}_2 \cdot 2\text{HI}$ . As is known,  $\text{OsO}_4$  does not liberate Cl from HCl. Osmium peroxide is readily volatilized, tolerably stable and devoid of acid properties. It is readily produced by the direct action of oxygen upon powdered osmium, which is the more remarkable because osmium is classified among the noble and heavy metals.—Pharm. Ztg., lii (1907), No. 89, 933; from Chem. Ztg., 1907, No. 85.



# ORGANIC CHEMISTRY.

## HYDROCARBONS.

(Including Volatile Oils and Derivatives.)

*Mineral Oils—Detection in Vegetable Oils with “Commercial” Picric Acid.*—Dr. Ferdinand Schulz-Kolin states that a solution of commercial picric acid in benzene produces a red color with mineral oils, and also with rosin oil, but not with other oils of either animal or vegetable origin. With refined petroleum a cherry-red color is produced, while vaselin oils or lubricating oils assume a more or less dark blood-red color, according to the degree of refinement. Moreover, *pure* picric acid does not produce this reaction, although the presence of small quantities of the “commercial” picric acid develops the reaction, which may thus serve for the detection of mineral (or rosin) oil in vegetable or animal oils and fats.—Apoth. Ztg., xxiii (1908), No. 29, 271; from Chem. Ztg., 1908, 345.

*Ichthyol—Variations in Composition.*—Dr. H. v. Hayek has made an experimental inquiry with the object of ascertaining to what extent any variations in the composition of ichthyol (= Ammonium Ichthyolsulphonate) is attributable to the variability of the mineral from which it is prepared. As is well known, ichthyol is prepared from an oily product obtained by the dry distillation of the so-called “asphaltstone,” a bituminous slade found in the Carwendel mountains of Northern Tyrol, which is purified, sulphonated by suitable treatment with sulphuric acid, and then neutralized with ammonia—the final product containing a little over 50 per cent. of the mixture of ammonium ichthyolsulphonate and sulphate so formed. Seven authentic specimens of ichthyol were subjected to analysis by the author, with the following results:

*Dry substances* = 51.70–54.96 per cent.; maximum variation = 3.26 per cent.

*Ammonia* = 2.93–3.11 per cent.; maximum variation = 0.18 per cent.

*Ammonium sulphate* = 5.73–5.95 per cent.; maximum variation = 0.22 per cent.

*Total sulphur* (calculated on dry substance) = 15.58–18.09 per cent.; maximum variation = 2.51 per cent.

*Oxidised sulphur* (calculated on dry substance) = 3.66–4.16 per cent.; maximum variation = 0.50 per cent.

*Non-oxidised sulphur* (calculated on dry substance) = 11.54–14.23 per cent.; maximum variation = 2.69 per cent.

While ichthyol is thus shown to vary considerably in its composition, these variations are not attributable to the method of preparation, except in so far as the water-content is concerned, but are due to the variable

nature of the material from which it is prepared, and may therefore be safely disregarded if within the limits demonstrated by the author's investigation.—Pharm. Ztg., lii (1907), No. 91, 950-951.

*Vaselines (Petrolatums) Pharm. Belgic.—Stringency of the Sulphuric Acid Test.*—W. Dulière finds the requirement of the Belgian Pharmacopœia, that neither the vaseline nor the concentrated sulphuric acid shall be appreciably browned when equal quantities are heated in a clean test glass for ten minutes in a steam-bath, is too stringent and is not fulfilled by any commercial qualities of vaseline which have been examined. The corresponding tests of the Swiss and the Dutch Pharmacopœias, prescribe sulphuric acid of 60 per cent. and 80 per cent. respectively, and these he considers the more practical strength under commercial conditions.—Pharm. Ztg., lii (1907), No. 80, 841; from Journ. de Pharm. d'Anvers, 1907, No. 16.

*Paraffin—Quality Suitable for the Paraffinprothesis.*—For the past several years paraffin has been used with good results for the removal of natural or accidental disfigurations by introducing layers of it under the epidermis, the method being designated as "paraffinprothesis." The paraffin used for this purpose must not alone be perfectly pure, must not be absorbable, but must possess a high melting-point and must have resistance to the normal external influences. These qualifications are, according to L. Spiegel, well presented by the so-called "hard paraffin," which melts between 50° and 75° C. If soft paraffin, or mixtures of such with hard paraffin, are used for this purpose there is more or less danger that considerable quantities of the injected material are liquefied and pressed from the original locality into the surrounding tissues, and so into localities of less resistance. The danger from embolia and inflammations of some of the organs would thus be established. Moreover, the hard paraffin may easily and completely be removed in the case of individuals who cannot tolerate its application, which can not be said of soft paraffin.—Pharm. Ztg., liii (1908), No. 31, 312; from Berl. Klin. Wschr., 1908, No. 9.

*Petroleum Ether—Remarkable Behavior of a Certain Sample.*—Professor John Marshall says that when commercial petroleum ether has been carefully re-distilled and the fraction between 20° and 50° C. is reserved for use, one is of the belief that no hydrocarbons non-volatile at room temperature are contained in the fraction, and this is usually demonstrated by evaporating a portion of the distillate at room temperature and observing whether any residue remains. A fraction from a commercial petroleum derived from the Pennsylvania oil field was so tested immediately after distillation, no residue remaining from 200 Cc. of the fraction; but on permitting the remaining portion of the distillate to stand 30 days at room temperature, exposed to diffused sunlight, in a stoppered flask, with an air space of about a liter above the surface of the liquid, and

evaporating 200 Cc. of it at room temperature, and then over sulphuric acid, a yellowish, cosmolin-like residue, weighing 0.0072 Gm., remained. The experiment was repeated with fresh portions of the same petroleum ether, with practically the same results, the 200 Cc. tested immediately after distillation leaving no weighable residue, while after ten days' standing 0.0007 Gm. residue was obtained. In other cases described, after standing 215 days, 200 Cc. of the fraction yielded 0.0494 Gm. of cosmolin-like residue. The composition of these residues was not determined. Their origin may possibly be due to polymerization; but it is very evident that a petroleum ether of this sort is not adapted for use in making extractions.—*Amer. Journ. Pharm.*, July, 1907, 315-317.

*Benzene—Determination of Carbon Bisulphide.*—L. Bay mentions that carbon bisulphide is frequently present as an impurity in commercial benzene. It may be detected and approximately determined by means of Liebermann and Seyewetz's reaction, precipitation as phenylhydrazine phenyl-sulpho-carbazinate  $[\text{CS}_2(\text{C}_6\text{H}_5\text{NH.NH}_2)_2]$ . Although this body is unstable in solution, it is sufficiently permanent in the dry state to permit weighing, if performed at once. Precipitation is completed in two or three hours; the precipitate is collected on counterpoised filters, washed free from excess of phenyl-hydrazine with pure benzene, dried *in vacuo*, and weighed quickly. The quantitative results obtained are a trifle high, in consequence of the presence of a trace of adherent phenylhydrazine.—*Pharm. Journ.*, April 4, 1908, 451; from *Compt. rend.*, 146 (1908), 132.

*Benzol—Detection in Alcohol.*—Holde and Winterfeld recommend the following practical method for the detection of small quantities of benzol in alcohol: 100 Cc. of the suspected alcohol are diluted with water to about 25 per cent. absolute alcohol, which occasions transient turbidity and a distinct odor of benzol, not observable before, is developed. On subjecting the mixture to distillation, diluting the first 10 Cc. of distillate obtained with 10-20 Cc. of water, and cooling this mixture with ice, any benzol present in the original sample taken will float upon the surface as an oily liquid, the volume of which may be approximately ascertained if a graduated vessel is used as receiver.—*Pharm. Ztg.*, liii (1908), No. 28, 279; from *Chem. Ztg.*, 1908, No. 25.

*Isoterpenes of Flawitzky—Identity with the Hydrocarbons Designated as Limonenes.*—Edward Kremers observes that possibly no chapter of Organic Chemistry has suffered more from a confusion of names and synonyms than has the one commonly comprised under the designation of terpenes and camphors. Though one would scarcely expect that the *isoterpenes* of Flawitzky could have contributed to this condition, they do not appear to have found their place in the fairly well regulated classification of these compounds at the present time—probably because the "Terpene Hydrate" and "Isoterpenene" of Flawitzky have not been re-

garded as sufficiently characterized to place them beyond reasonable doubt. With the object of clearing up their identity, Kremers reviews the work of Flawitzky, which is supplemented by work on the same subject carried out under his direction in the laboratory of the University of Wisconsin, in 1893. Flawitzky began his investigations along this line in 1879 on the lævogryate modifications, and concluded them in 1885 on the dextrogryate modifications. The changes brought about are briefly as follows: Dextropinene obtained from Russian oil of turpentine, and lævopinene from French oil of turpentine were hydrated by means of dilute alcoholic sulphuric acid, and the hydrates were then dehydrated by means of acetic acid anhydride. His investigations of the products obtained led to the conclusion that the isomerides of the two terpenes bore a close relationship to the hydrocarbons designated as limonenes, viz.; "lævo-isoterpene" to "l-limonene," from elemi; "dextro-isoterpene" to "d-limonene," from lemon oil; and, furthermore, that the isoterpenes obtained by the isomerization of these terpenes are distinguished from the natural isoterpenes only by a larger or smaller content of inactive isoterpenes. These conclusions have been confirmed chemically by the supplementary investigations conducted under the direction of Kremers, which are described in detail in the present paper.—Pharm. Rev., April, 1908, 102-106.

*The Volatile Oils, 1901-1903* is the title under which J. W. Brandel, in a series of papers reviews the work done on volatile oils during the period indicated, which is intended to fill the gap between the 1900 and 1904 edition of "The Volatile Oils" of Gildermeister and Hoffman (Kremers'), and may be consulted in Pharm. Rev., 1907, No. 10 (pp. 296-298), No. 12 (pp. 362-366), and 1908, No. 2 (pp. 56-64), and No. 3 (pp. 88-96).

*Volatile Oils—Optical Rotation.*—L. H. Bernegau mentions a number of volatile oils—coriander, thyme, orange, anise—which stood the U. S. P. tests for specific gravity, solubility, odor, general appearance, etc., but did not answer the optical requirements. Oil of eucalyptus, although having the required optical rotation, contained only 10 to 15 per. cent. of cineol. Of fifteen samples of oil of sandalwood, all with a high santalol percentage, 13 showed also a satisfactory optical rotation ( $-16^{\circ}$  to  $-20^{\circ}$  C.); the other two to read  $-10.5$  to  $-11.2^{\circ}$  C. respectively.—Amer. Journ. Pharm., Dec., 1907, 554.

*Volatile Oils—The Question of Adulteration.*—Drs. George R. Pancoast and W. A. Pearson observe that the American who ordinarily demands honest dealing and despises deception, accepts with amazing weakness the present volatile oils. It is an open secret that sophistication is practiced, due largely to the extreme pressure of competition and the demand for cheaper products. The authors do not contend that only the highest grade should be sold, for that would greatly limit the scope of usefulness,

but they do think that each grade should be sold under its proper label. It has been demonstrated that cheaper grades do not endanger the market for the best quality, but that indirectly the sale of the better grade is augmented, the cheaper grade finding new uses where the best grade is limited because of its price. This is the true condition at Grasse, the very center of volatile oil production, and is equally true of many of our commodities. Deception steps in when a cheap article is given for an expensive one.

The main use of volatile oils is in imparting agreeable flavors and odors to various products. Unfortunately, a certain sample may be pleasing to one and obnoxious to another, and this introduces a serious problem in valuation, namely the personal equation. A vast amount of accurate work has been done with volatile oils in determining certain physical and chemical properties and setting limits for natural variation, but often the desirable or most valuable portion which produces the delicate aroma is not considered. The odorous constituents are often so delicate that chemical estimation is impossible. The practical method of valuation is the comparison of odors by experts. The nobility have their perfumers, whose duty it is to blend and select odors to be used at various functions. So delicate has their sense of smell become, that only a few samples are compared each day. This is the perfumer's art; he has both the natural and artificial products at his disposal, and his duty it is to combine them into a perfect harmony of pleasing odors. At present it is an art—it may become a science. At present, undoubtedly, adulteration is practiced, and we must largely depend on the integrity of the distiller.—*Amer. Journ. Pharm.*, May, 1908, 216–221.

*Terpeneless Volatile Oils—Comparative Antiseptic Value.*—Experiments made by K. Kobert with terpeneless volatile oils in comparison with those containing terpenes, prove the antiseptic value of the two kinds to be practically the same. The determinations were made with the aid of the so-called "milk-sulphur method," which is based on the fact that the bacteria in normal milk are capable of converting finely-divided sulphur suspended in it into  $H_2S$ , identifiable by means of lead-paper, but that this conversion is prevented in the presence of antiseptics. The results upon which the author bases his conclusions were obtained with both the terpene-containing and terpeneless oils of: celery, lemongrass, bergamot, lemon, anise, dill, peppermint, eucalyptus, bay leaves, rosemary, cloves, cassia and lavender. A few of the terpeneless oils, among them the oils of bergamot and lemon, proved to be even more powerful than the oils containing terpenes, while none of them were found to possess inferior antiseptic activity.—*Pharm. Ztg.*, lii (1907), No. 81, 852; from *Pharm. Post*, 1907, No. 37.

*New Volatile Oils—Description.*—The following new volatile oils are briefly described in Haensel's Report of March, 1908:

*Acaroides Resin Oil.*—The volatile oil of Australian gum acaroides is a

reddish-brown liquid, with an odor recalling Tolu or Peru balsam, specific gravity 0.960 at 60° C., optically inactive; acid value, 47.6; ester value, 37.5; it yields 1.94 per cent. of cinnamic acid to solution of sodium hydroxide. Besides this dilute sodium hydroxide removes 7.6 per cent. of a yellowish resin; on saponifying this washed oil a further separation of cinnamic acid and of resin was obtained. Styrol is also present in the oil.

*Birch Leaf Oil.*—Birch leaves have yielded 0.04 per cent. of yellowish volatile oil, solid at normal temperatures; specific gravity, 0.8638 at 80° C.; acid value, 30; ester value, 81; insoluble in alcohol, 96 per cent. When dissolved in hot alcohol it deposits, on cooling, crystals of a paraffin, melting-point 49°–50° C.

*Guaiacum Resin Oil.*—The resin of *Guaiacum officinale* gives 0.03 per cent. of dark-brown aromatic oil when distilled with live steam. Specific gravity, 0.9417 at 15° C.; acid value, 77; ester value, 12.8; it reduces ammoniacal silver nitrate. Not entirely soluble at the ordinary temperature in alcohol, 69 per cent.

*Ground Ivy Oil.*—Dry ground ivy gave, when distilled with live steam, 0.064 per cent. of oil, with a penetrating, unpleasant odor, and showing a solid separation. Specific gravity, 0.9296; acid value, nil; ester value, 111. It contains traces of an aldehyde or a ketone.

*Chelidonium Oil.*—*Chelidonium majus*, when dried and distilled with live steam, yielded 0.0127 per cent. of brown, agreeably odorous, volatile oil, solidifying at 30° C.; specific gravity at 40° C., 0.9374; solubility in 90 per cent. alcohol, 1:45.

*Sweet Orange Oil.*—Terpene-free sweet orange oil, obtained from Spanish fruits, has exhibited a much more intense dextro-rotatory power than terpene-free oil from Italian fruits.—Apoth. Ztg., xxiii (1908), No. 30, 279.

*Allyl-Mustard Oil—Volumetric Determination.*—The method of the G. P. IV for the volumetric determination of allyl-mustard oil in spiritus sinapis having been criticised unfavorably by Firbas, Max Kuntze has studied the conditions under which the determination is effected with the object of correcting the method. Briefly, this depends on the decomposition of the oil by subjecting it to the action of ammoniacal silver nitrate at the ordinary temperature for 24 hours, during which the precipitation of the sulphur of the oil, as silver sulphide, is expected to be completed; then subjecting the acidified product of the reaction to titration with  $\frac{N}{10}$  ammonium sulphocyanate. As pointed out by Firbas, the author finds that the values are materially increased if the reacting mixture is heated after standing 24 hours, which proves that the decomposition of the oil is not complete and the results of the test therefore misleading. He finds, moreover, that the preliminary exposure of the mixture at the ordinary temperature is not only unnecessary before the

heating—for which one hour is sufficient—but that the formation of allyl-oxythiourethane during the prolonged exposure of the mixture at the ordinary temperature is also a source of error, which is practically obviated if the prescribed mixture is immediately subjected to heat. The author therefore recommends the following modification of the G. P. IV test: 5 Cc. of spirit of mustard (= 1-50) are mixed with 10 Cc. of ammonia water and 50 Cc. of  $\frac{N}{10}$  silver nitrate solution, in a 100-Cc. flask; this is closed with a cork into which a glass tube 1 meter long is inserted (to serve as a reflux condenser), and the mixture is *immediately* heated in an actively boiling water-bath for *one hour*. After cooling to 15° C., filtration, and adjustment to 100 Cc. with distilled water, 50 Cc. of the clear filtrate are slightly acidified with nitric acid, 1 Cc. of ferric ammonium sulphate solution is added, and the mixture is titrated with  $\frac{N}{10}$  ammonium sulphocyanate solution until a red color is developed, for which purpose 16.6 to 17.22 Cc. should be required. The reliability of this modified method is exhibited in a table embracing the results of numerous determinations.—Arch. d. Pharm., 246 (1908), No. 1, 58-69.

*Volatile Oil of Brassica Rapa var. Rapifera, Metzger.*—Characters and composition, see *Turnips*, under “Materia Medica.”

*Oil of Bitter Almonds—Substitution of Benzaldehyde in Commercial Oils.*—Frank O. Taylor has subjected twenty-two samples of oil of bitter almonds from various sources to the U. S. P. tests. The specific gravities of these oils and their solubility in 70 per cent. alcohol conformed to the official requirements, but only five samples were found to be free from chlorinated compounds, the presence of which was revealed in the remaining seventeen samples both by the copper test and the silver nitrate test. The presence or absence of hydrocyanic acid afford no criterion of genuineness since they may be removed purposely from a genuine oil or added to the sophisticated oil. In the present investigation, hydrocyanic acid was present in two and absent in the other three samples of pure oil, while in the oils containing chlorinated compounds, six contained hydrocyanic acid, and eleven were free from it. In six of the oils, wholly or partly sophisticated with synthetic benzaldehyde, the attempt was therefore made to duplicate more nearly the genuine oil. The author criticises some of the U. S. P. requirements as erroneous, and particularly the assay method of benzaldehyde, the introduction of which into the Pharmacopœia he considers to have been premature. The chief difficulty with the process is the uncertainty attendant upon the determination of the end-point.—Amer. Journ. Pharm., April, 1908, 154-162.

*Benzaldehyde—Pharmacopœial Assay.*—E. S. Wright experienced difficulty in determining the exact end-reaction and in obtaining concordant results in the assay of benzaldehyde by the official process. Three assays of the same sample gave 79.423, 78.023, and 77.382 per cent. Rosolic

acid was tried as indicator, but proved unsatisfactory. The official assay was modified to the extent of heating the benzaldehyde, kerosene and sodium sulphite together in a glass-stoppered bottle to 60° C., cooling and then titrating. The results in seven assays of the same sample ranged from 80.33 to 86.916 per cent., average 83.96. An attempt to adopt the official assay for formaldehyde to the assay of benzaldehyde also failed, as did treatment with an excess of sodium bisulphite and titration of the excess of bisulphite with iodine V. S., owing to the difficulty in determining the end reaction.—*Amer. Journ. Pharm.*, Aug., 1907, 366.

*"Absinthe" Oils—Relative Turbidity Produced by Diluting their Alcoholic Solutions with Water.*—The opinion being frequently expressed that the injurious character of the liqueur, known as "absinthe," can be judged from the occurrence of a more or less strong turbidity when a definite quantity of water is added to it, Sanglé-Ferrière and Cuniasse examined the volatile oils used in the manufacture of this "liqueur" for their behavior towards water. Each of the oils was dissolved in 70 per cent. alcohol in the proportion of 3 Gm. per liter, and to this solution  $\frac{2}{3}$  of its volume of distilled water was added. The turbidity numbers determined with the aid of a diaphanometer, were for the individual oils as follows: Wormwood oil, 40.4; oil of tanzy, 53.0; hyssop oil, 34.0; coriander oil, 34.0; fennel oil, 12.0; star-anise oil, 3.4; anise oil, 2.2. These numbers indicate the height in millimeters at which the finest lines of the diaphanometer screen can no longer be distinguished. From these results it is quite clear that the occurrence of turbidity when water is added cannot be accepted as a criterion for the injurious character of the oil in question, the reverse being actually the case, since the strongest turbidity is caused by the comparatively harmless and non-poisonous spice oils—fennel, star-anise and anise—while, in the case of the most strongly toxic thujone-containing oils—wormwood and tanzy—the turbidity was the most feeble. The authors propose that the total oil content of the "liqueur" be determined and a test made for the presence of thujone.—*Schimmel's Rep.*, Oct., 1907, 98; from *Journ. de Pharm. et Chem.*, vi, 25 (1907), 428.

*Japanese Angelica Oil—Characters and Constants.*—Schimmel & Co. report the results of examination of Japanese angelica oil, recently distilled by them. It was obtained in a yield of 0.1 per cent.; possessed an olive-green color, and an odor scarcely distinguishable from that of the oil obtained from German roots (*Archangelica officinalis*, Hoffm.); sp. gr., 0.9081 at 15° C.; opt. rot.,  $-1^{\circ} 40'$ ; acid no., 10.6; ester no., 39.8; incompletely soluble in 10 vol. 90-per cent. alcohol; soluble in every proportion in 95-per cent. alcohol; deposits abundant white crystals when subjected to a freezing mixture (oxypentadecylic acid?).—*Schimmel's Rep.*, Oct., 1907, 15.

*Oil of Artemisia Cina—Terpineol a Constituent.*—J. Schindelmeiser communicates the results of a comprehensive investigation of the volatile



oil of *Artemisia cina*, which demonstrate the presence of terpineol. This is particularly interesting, because terpineol, although a constituent of many plants belonging to different families, has heretofore been found only in a single plant belonging to the compositæ—namely, in the oil of *Erigeron canadense* (by Power, 1887, and Hunkel, 1895). From 2 Kgm. of the oil, the author obtained about 30 Gm. of terpineol. Beside this, and the principal constituent, cineol, the oil contained also small quantities of pinene and terpinene.—Apoth. Ztg., xxii (1907), No. 81, 875-877.

*Oil of Asarum Canadense—Yield and Characters.*—Schimmel & Co. report the results of the distillation and examination of the oils obtained from the air-dried rhizomes with rootlets of Canada snake root, from the rhizomes deprived of rootlets, and from the rootlets themselves, which were as follows:

*The oil from rhizomes and rootlets* was yellow-brown and aromatic, in a yield of 3.36 per cent.;  $d_{15}^{\circ}$  C., 0.9508;  $a_D$ ,  $-2^{\circ} 0'$ ;  $n_{D20}^{\circ}$  C., 1.48537; acid No., 3.7; ester No. 115.9; ester No. after acetylation, 140.1; soluble in 2.7 and more vol. 70 per cent. alcohol.

*The oil from rhizomes without rootlets* (yield 3.83 per cent.), had a purer yellow color, and the following constants:  $d_{15}^{\circ}$  C., 0.9516;  $a_D$ ,  $-2^{\circ} 50'$ ;  $n_{D20}^{\circ}$  C., 1.48508; acid No., 3.7; ester No., 117.6; ester No. after acetylation, 137.2; soluble in 2.3 and more vol. 70 per cent. alcohol.

*The oil from rootlets only* (yield 1.20 per cent.), had the following constants:  $d_{15}^{\circ}$  C., 0.9659;  $a_D$ ,  $-39^{\circ} 40'$ ;  $n_{D20}^{\circ}$  C., 1.50280; acid No., 2.2; ester No., 39.2; ester No. after acetylation, 110.2; insoluble in 10 vol. 70 per cent. alcohol; soluble in 0.9 and more vol. 80 per cent. alcohol.—Schimmel's Rep., April, 1903, 98-99.

*Ayapana Oil—Constituents.*—Referring to a specimen of ayapana oil distilled in the French island of Mayotta from *eupatorium triplinerve*, Vahl, described a year ago (see Proceedings, 1907, 873), Schimmel & Co. mention that they have received some of the leaves of the plant from Ceylon, from which they were enabled to produce an authentic distillate, having the following constants:  $d_{15}^{\circ}$  C., 0.9806;  $a_D + 2^{\circ}$  C., 55; acid No., 5.5; ester No., 5.9; soluble in 1.5 and more vols. 90 per cent. alcohol; yield, 1.14 per cent. They also received a second sample of ayapana oil, which behaved exactly in the same manner as the one previously described. A more detailed examination of this oil was made by Semmler, who found the principal fraction to consist of a mixture of an oxygenated body and a sesquiterpene. The oxygenated body, on purification, was found to have the composition  $C_{12}H_{18}O_2$ , and found on further investigation to be the dimethyl ether of thymohydroquinone, a body hitherto only found (by Sigel) in oil of arnica root.—Schimmel's Rep., April, 1908, 17, and Berl. Berichte, 41 (1908), 509.

*Oil of Bergamot—Value of Acid Number for Detecting Adulteration.*—

Dr. Salvatore Gulli observes that, inasmuch as the value of bergamot oil is commonly determined by the ester content, the introduction of a new adulterant is a matter of commercial and scientific interest. The new method of adulteration consists in the addition of lemon or bergamot terpenes, and of small quantities of volatile acids or of artificial acid esters soluble in the oil, which products increase the apparent proportion of linalyl acetate. Among the volatile acids which have been detected by him in bergamot oil is benzoic acid, while among the esters used as adulterants the ethyl esters, particularly ethyl succinate, seem to lend themselves to this purpose. The esters, besides being detected by the method suggested by C. T. Bennett (see Proceedings, 1907, 871), can also be detected by their increasing the acid number of pure oils. The author has found this to range from 0.10 to 0.15 per cent. calculated as acetic acid, and at most 0.20 per cent. in old oils. The following tables (I and II) show the acid numbers of several pure oils of the present year, and of some commercial bergamot oils of suspected quality :

TABLE I.—PURE OILS.

	Sp. gr. at 20° C.	Opt. rot. at 20° C. in 100 mm. tube.	Ester content.	Alcohol solubility.	Acid number per cent.
1.....	0.8852	+11° 50'	40.10	Soluble.	0.09
2.....	0.8832	+14° 00'	37.10	"	0.08
3.....	0.8856	+10° 50'	40.65	"	0.08
4.....	0.8842	+11° 80'	38.25	"	0.10
5.....	0.8835	+14° 90'	37.32	"	0.12
6.....	0.8824	+12° 50'	36.84	"	0.14
7.....	0.8831	+11° 25'	37.45	"	0.11
8.....	0.8848	+16° 50'	39.50	"	0.15

TABLE II.—ADULTERATED OILS.

	Sp. gr. at 15° C.	Opt. rot. at 20° C. in 100 mm. tube.	Ester content.	Alcohol solubility.	Acid number per cent.
1.....	0.8806	+20° 50'	35.85	Turbid.	0.35
2.....	0.8805	+18° 75'	36.40	"	0.40
3.....	0.882	+10° 50'	36.05	"	0.42
4.....	0.8812	+22° 80'	35.70	"	0.30

The high acid content of the oils in the second table justifies the suspicion that they have been adulterated with acids to raise their apparent ester content.—Chem. & Drugg., Sept. 21, 1907, 475.

*Oil of Bergamot—Constants, Adulterants, Etc.*—Edwin Dowzard states that the constituents of bergamot oil which have so far been identified are: linalyl acetate, linalol, limonene, and bergaptene. Of these, linalyl acetate, which, although modified by other bodies, gives the characteristic odor to bergamot oil, has received most attention. It should be present in the pure expressed oil to the extent of about 32 to 40 per cent., while that obtained by steam distillation, or rectification, contains much less (12 to 22 per cent.), due to decomposition of the ester. The color of bergamot oil is due to the presence of chlorophyll. The principal adulterants are distilled bergamot oil, lemon oil, orange oil, citrene, turpentine (oil) and alcohol, all of which cause a decrease in density and a lowering of the ester content. Lemon oil, orange oil and citrene, increase the optical rotation. Fatty oils, occasionally esters other than linalyl acetate, and sometimes free acid, are also used as adulterants. The author records the result of a recent examination of 23 samples of bergamot oil. Of these, 14 were normal oils, the remaining nine being probably adulterated as follows: Three with distilled bergamot oil, four with lemon and orange oils and citrene, one with turpentine, and one with alcohol and free acid. The results of the author's investigation show that the minimum amount of linalyl acetate in pure bergamot oil (obtained by expression) may be fixed at about 32 per cent., and lead him to recommend the following constants: specific gravity at 15° C., 0.881 to 0.886; rotation (100 Mm.), +8° to +24°; solubility value,\* 220 to 290; residue (non-volatile), 4.3 to 6.4 per cent.; acid value, 1.4 to 4.2; linalyl acetate, 32 per cent. and upwards.—Amer. Journ. Pharm., May, 1908, 204-208.

*Bergamot Oil—Adulterated Specimens.*—C. M. W. Grieb finds that adulterated oil of bergamot is still being offered as the genuine article. The following figures are the results of a recent examination of two samples of "guaranteed genuine" bergamot oil from different sources; without even determining the acid number they clearly showed that both oils were adulterated:

---

\* The "solubility value" is determined by the method recommended by Mr. Dowzard in 1898 (see Proceedings, 1899, 659), depending on the amount of water necessary to produce permanent turbidity in a given volume of a solution of the oil in certain definite proportions of strong alcohol.

—	Sp. Gr. at 15.5° C.	Optical rota- tion in 100-Mm. tube.	Residue after evaporation at 100° C.	Ester content.
1	0.892	+ 17° 0'	2.98 per cent.	33.5 per cent.
2	0.875	+ 21° 30'	3.96 per cent.	30.2 per cent.

Both samples were soluble in half their volume of 90 per cent. alcohol, and the solubility was not disturbed by adding more alcohol. They were both quite insoluble in twice their volume of 80 per cent. alcohol, sample 2 not even dissolving in ten times its volume. The presence of lemon oil was proved in sample 2, while terpinyl acetate was probably the adulterant in sample 1.—Chem. & Drugg., Mar. 7, 1908, 383.

*Betle Oil—New Constituents.*—When isolating chavibetol from an oil of betle leaves originating from Java, Schimmel & Co. made the interesting observation that the oil in question—which had in the course of years acquired a dark-brown color—contained, in addition to chavibetol, another, solid, phenol, which has up to the present neither been produced synthetically, nor been found in the vegetable kingdom. This phenol, which was present to the amount of 1.8 to 2 per cent. of the oil, when purified from petroleum ether alone, or preferably from benzene and petroleum ether, forms long, colorless, downy needles, m. p. 48°–49° C., b. p. 139° C. (4 Mm. pressure). Its alcoholic solution is colored deep green by ferric chloride. An alkaline solution of the phenol acquires very rapidly a dark red color. Its odor is comparatively faint, and distinctly reminds of creosote. It dissolves readily in water. Analysis led to the empirical formula  $C_9H_{10}O_2$ . Further investigation proved the new body to be "*allyl pyrocatechol*." Besides this the oil under examination was found to contain, in addition to the already known constituents, a terpene, cineol, eugenol methyl ether, and caryophyllene.—Schimmel's Rep. Oct., 1907, 16–18.

*Oil of Boldo Leaves—Physical Constants and Constituents.*—In view of the fact that up to the present, little was known of the chemical composition of the volatile oil of boldo leaves (*Peumus Boldus*, Mol.), Schimmel & Co. communicate briefly the results obtained by them in the examination of an oil of their own distillation. The physical contents of the brown-yellow oil were: sp. gr., 0.9567 at 15° C.; opt. rot., + 0° 28'; index of refraction (20°), 1.47928; soluble in 8 to 9 vol. 70 per cent. alcohol; acid No., 2.4; ester No., 11.2. It distilled between 40° C. and 105° C. (30 mm. pressure). Its odor greatly resembled that of oil of chenopodium, and examination confirmed the surmise that the oil contained the characteristic constituent of the formula  $C_{10}H_{16}O_2$ , which they had isolated

some time ago from American wormseed oil. It is present to the amount of 40 to 45 per cent., and with cymene and cineol (together about 30 per cent.) constitutes the chief constituents of the oil of boldo leaves.—Schimmel's Rep., Oct., 1907, 19.

*Camphor Oil—d-Limonene a Constituent.*—Schimmel & Co. obtained from camphor oil a fraction which had the following constants: b. p.  $175.5^{\circ}$  to  $177^{\circ}$  C. (763 mm. press.),  $d_{15}^{\circ}$  C. 0.8470,  $a_D + 39^{\circ} 46'$ ,  $n_{D20}^{\circ}$  C. 1.47533. The high rotation gave rise to the suspicion that in addition to the dipentene which Wallach had already discovered a considerable time ago, there might also be present not in considerable quantities *d-limonene*, and undoubted proof of the presence of this was obtained by experiments which are described in some detail.—Schimmel's Rep., April, 1908, 25.

*Camphor.*—The synthesis of camphor and the production of camphor from natural sources are the subjects of two papers, by A. R. L. Dohme, in the "Proceedings" of this Association, 1907, 457-465.

*Synthetic Camphor—Review of Patented Processes.*—Lyman F. Kebler gives a brief review of the various processes which have been patented for the preparation of synthetic camphor. The first patent on synthetic camphor, in so far as known to him, was issued in Germany, April 12, 1892, to J. Bertram. It consists in converting camphene into isoborneol acetate, saponifying the acetate, and oxidizing the liberated isoborneol by the usual oxidizing agents. Most of the patents mentioned, and they are many, hinge either upon the production of isoborneol from some terpene oil, or upon the method of converting (oxidizing) the latter into camphor. The author's résumé is very interesting, but must be consulted in the original.—Amer. Journ. Pharm., Aug., 1907, 349-356.

Referring to the above review of the processes which have been devised for the synthetic production of camphor, Frank Tutin calls attention to a number of inaccuracies, which he regards as being so fundamental in their nature, that it seems desirable that attention should be drawn to them. Mr. Kebler's paper should therefore be consulted under these restrictions.—Ibid., Dec., 1907, 551-553.

*Camphor—Method of Distinguishing the Natural from the Artificial Product.*—P. Borisch finds vanillin-hydrochloric acid (1 per cent. solution of vanillin in 25 per cent. HCl) to be suitable for distinguishing natural camphor (and borneol) from artificial (synthetic) camphor. If a fragment of natural camphor is added to 1 Cc. of the vanillin-hydrochloric acid in a test-tube there is no color developed, at the ordinary temperature, even on standing 24 hours; but if heat is applied carefully, a blue-green color is developed at  $60^{\circ}$  C., becoming handsome blue at  $70^{\circ}$  C., and blue-green at  $100^{\circ}$  C. If, however, the same drug, pulverized by sublimation, be added to the reagent in small quantity (a knife-point full?) a handsome rose color develops after a few minutes at the ordinary

temperature, changing after 24 hours to a faint gray-green ; but if heat is applied, as in the previous case, then the change from a rose color at 30° C. is to a gray at 60° C., deep-green, somewhat turbid, at 70° C., and bright-green at 100° C. Borneol (Borneo- or Sumatra-camphor) gives similar color reactions with the reagent ; it remains unchanged in color at 30° C., becomes dirty-yellow at 60° C., blue at 70° C., and deep-blue at 100° C. On the other hand, artificial camphor, in two samples, designated respectively as "Camphora artificialis pulv." and "Camphor, C. P., synthetic," gives no color reaction whatever with the vanillin reagent under any of the conditions mentioned ; nor is any reaction observable in mixtures of artificial camphor, containing 5 per cent. of natural camphor, the limit of reaction being the presence of 10 per cent. of the latter in admixture with the synthetic product.—Pharm. Ztg., lii (1907), No. 54, 565 ; from Pharm. Centralh., 1907, No. 26.

In continuation of his studies on the color reactions of camphor described in the preceding abstract, the author now has obtained results which convince him that these are not due to the camphor itself, but are produced by impurities contained in the natural camphor. When this is purified by crystallization from ligroin or benzin, the pure product does not give the color reactions, while the mother-liquors readily do so.—Pharm. Centralh., xlviii (1907), No. 38, 777-780.

*Racemic (= Synthetic) Camphor—Therapeutic Identity with Natural Camphor.*—Comparative pharmacological experiments made by A. Langgaard and A. Maass made with synthetic (optically inactive or racemic camphor), the natural (dextro-rotatory) camphor, and the laevo-rotatory camphor, obtained from l-borneol, prove that the so-called racemic (synthetic) camphor has a pharmacological activity which is identical in every respect with that of the two natural camphors. These conclusions are confirmed by the results of Prof. Goerlitz, who has used racemic (synthetic) camphor in place of natural camphor in the Charlottenburg Hospital, and found no differences in the effects either when used internally or for external applications.—Pharm. Ztg., lii (1907), No. 92, 962 ; from Therap. Monatsh., 1907, No. 11.

*Camphor—Mercury-Derivatives.*—E. Marsh and R. de Jersey have obtained and describe several mercury derivatives of camphor. If camphor is heated with an alkaline solution of mercuric iodide, and the solution obtained is precipitated with glacial acetic acid,

*Camphor-mercuric-diiodide*,  $C_{10}H_{14}OHgI_2$ , is produced. After filtration, the filtrate, diluted with water, yields with potassium iodide, or better with a solution of mercurio-potassium iodide, an orange-colored precipitate of the composition  $C_{10}H_{14}O.HgI + HgI_2$ . This, on treatment with neutral potassium iodide solution, is converted into the yellowish

*Camphor-mercuric-iodide*,  $C_{10}H_{14}O.HgI$ . Furthermore, the acetic solu-

tion yields with potassium chloride and bromide white precipitates, respectively of

*Camphor-mercuric-chloride* ( $C_{10}H_{16}O.HgCl$ ) and

*Camphor-mercuric-bromide* ( $C_{10}H_{16}O.HgBr$ ); but these last two derivatives have not yet been obtained perfectly free of iodine.—Pharm. Ztg., lii (1908), No. 38, 379; from Chem. C.-Bl., 1908, i, No. 12.

*Di-iod Camphor—Preparation and Characters.*—E. Marsh and R. de J. Fleming Struthers obtain di-iod-camphor as follows: Camphor and an alkaline solution of mercuric oxide and potassium iodide are allowed to react upon each other, whereby a mercury derivation of camphor results, which is insoluble in water, but soluble in alcohol, and, on further treatment with iod-mercuric iodide, yields di-iod-camphor. This forms yellow crystals, melting at  $108^{\circ} C.$ , which are soluble in alcohol, benzene and chloroform, its solution in chloroform being dextro-rotatory. While di-iod-camphor is stable in its crystalline condition, its solutions are decomposed by exposure to light, with elimination of iodine.—Pharm. Ztg., lii (1907), No. 72, 748; from Proc. Chem. Soc., 23 (1907), 119.

*Oil of Canarium Cumingii, Engl.—Constants and Composition.*—In connection with Clover's investigation of the oil from *Manila elemi* (which see under "Materia Medica") the following description of the so-called

*Pagsainquin Oil*, obtained from the resin of *Canarium Cumingii*, Engl., which was received by Schimmel & Co. from the Bureau of Science of Manila, is interesting. The oil was mobile, pale green, almost colorless, and showed the following constants: Sp. gr., 0.8627 at  $15^{\circ} C.$ ; opt. rot.,  $+11^{\circ} 3'$ ; index of refract. ( $20^{\circ} C.$ ), 1.47245; soluble in 3 and more vols. of 90 per cent. alcohol. On distillation the oil passed over at from  $158^{\circ}$  to  $183^{\circ} C.$ —the bulk (70 per cent.) boiling between  $165^{\circ}$  and  $177^{\circ} C.$  The principal constituent of this oil appears to be *cymene*.—Schimmel's Rep., Oct., 1907, 40.

*Volatile Oil of Cardamine Amara, L.—Constituents.*—In continuation of previous investigations by K. Feist concerning the characters and constituents of the volatile oil of *Cardamine amara*, L., Max Kuntze reports the results of his own experiments, undertaken to determine the optical activity and identity of the thio-urea found by Feist as the principal constituent. From the brown oil obtained from 27 pounds of the commercial herb he succeeded in isolating, by a method described, two kinds of crystals. The one kind, composing the greater part, was identified to be secondary *d*-butyl-thio-urea, in the form of colorless leaflets and needles, melting at  $136^{\circ} C.$  The smaller portion of the crystals was obtained in the form of rosette-shaped druses. These melted at  $159^{\circ} C.$ , and are apparently also a thio-urea, which, the author conjectures, may prove identical with benzyl-thio-urea,  $C_6H_{10}N_2S$ . The latter melts at  $162^{\circ} C.$ ,

and also crystallizes in rosette-shaped aggregations. Moreover, it has been prepared by Gadamer from the volatile oil of *Lepidium sativum*, and it is by no means precluded that the commercial herb of *Cardamine amara*, L., may have been contaminated with that of *Lepidium sativum*. With regard to the principal crystalline constituent of the oil, the secondary *d*-butyl-thio-urea, the author confirms Feist's observation that it is optically dextro-rotatory. He finds this to be  $\alpha_D^{20} \text{ C.} = +19.96^\circ$ , but these figures may require correction, owing to the possible presence of the druse-like crystalline body as impurity. For the same reason it was not practicable to make an elementary analysis, but the author considers the identity of the thio-urea to be well established.—Arch. d. Pharm., 245 (1907), No. 9, 657-659.

*Oil of Carrot Seed—Constants.*—Schimmel & Co. have lately distilled an oil from the German fruits of *Daucus Carota*, L., and found that its constants differed somewhat from those of oils examined in 1902 and 1904. The brownish-yellow oil, which possessed only to a slight extent the characteristic odor of carrots, was obtained in a yield (from fruits not rasped) of 1.26 per cent., and had the following constants: Sp. gr., 0.9226 at  $15^\circ \text{ C.}$ ; opt. rot.,  $-13^\circ 5'$ ; acid No., 2.2; ester No., 17.8; ester No. after acetylation, 77.5; soluble in 1.8 and more vol. 80 per cent. alcohol. The other distillates showed the following constants:

*Distillate of 1902:* Sp. gr., 0.9226 at  $15^\circ \text{ C.}$ ; opt. rot.,  $-23^\circ 16'$ ; acid No., 4.6; ester No., 30.6; soluble in 4.5 and more vol. 80 per cent. alcohol.

*Distillate of 1904* from French rasped fruits (yield 0.5 per cent.): Sp. gr., 0.9117 at  $15^\circ \text{ C.}$ ; opt. rot.,  $-18^\circ 18'$ ; acid No., 1.24; ester No., 51.93; ester No. after acetylation, 95.7; not completely soluble in 10 vol. 80 per cent. alcohol; soluble in 0.4 and more vol. 90 per cent. alcohol.—Schimmel's Rep., Oct., 1907, 31.

*Ceylon Cardamom Oil—Sabinene a Constituent.*—When examining Ceylon cardamom oil, Wallach found a hydrocarbon (sp. gr. 0.846; b. p.  $165^\circ$ – $167^\circ \text{ C.}$ ) which yielded terpinene dihydrochloride (m. p.  $52^\circ \text{ C.}$ ) on treatment with glacial acetic and hydrochloric acids. The surmise that this hydrocarbon might be "sabinene" was confirmed by its oxidation with potassium permanganate to "sabinenic acid" (m. p.  $56^\circ$  to  $57^\circ \text{ C.}$ ). The corresponding boiling fraction of

*Oil of Marjoram* also yielded on oxidation sabinenic acid, and consists therefore of sabinene. The presence of "terpinene" (which had already previously been detected in these two oils) may, since the presence of sabinene in the two oils has now been proved, be probably attributed to a conversion of this hydrocarbon into terpinene.—Schimmel's Rep., Oct., 1907, 31; from Nachr. K. Ges. Wiss., 1907 (July 20).

*Cedarwood Oil—Chemistry of the Hydrocarbon Constituent.*—F. W. Semmler and A. Hoffmann have subjected\* the hydrocarbon present in oil



of cedarwood, the "natural cedrene," to closer examination. They determine the crude cedrene to have the following properties: B. p.,  $124^{\circ}$  to  $126^{\circ}$  C. (12 Mm. press.);  $d_{15}^{\circ}$  C., 0.9354;  $a_D$ ,  $-55^{\circ}$ ;  $n_D$ , 1.50233. The crude cedrene consists chiefly of a single unsaturated tricyclic sesquiterpene, *cedrene* ( $C_{15}H_{24}$ ), which yields on oxidation with permanganate, etc., the following derivative products: *Cedrene glycol* ( $C_{15}H_{28}O_2$ ), *cedrene keto acid* ( $C_{15}H_{24}O_3$ ), and *cedrone* ( $C_{15}H_{24}O$ ). In addition to cedrene the crude cedrene contained small portions of substances of a lower rotatory power.—Schimmel's Rep., April, 1908, 28–29; from Ber. d. D. Chem. Ges., 40 (1907), 3521.

*Cedrene*—*The Main Constituent of Cedar Oil*.—According to F. W. Semmler and A. Hoffman, cedrene, a sesquiterpene,  $C_{15}H_{24}$ , is the main constituent of the essential oil of *Juniperus virginiana*. When oxidized with permanganate it yields cedrene glycol,  $C_{15}H_{28}O_2$ , in well-formed sublimable crystals, melting-point  $160^{\circ}$  C., which give the characteristic glycol reaction with dilute sulphuric acid. A cedrene ketone,  $C_{15}H_{24}O$ , boiling-point  $165^{\circ}$  C., is also formed, and cedrene ketonic acid,  $C_{15}H_{24}O_3$ , boiling-point  $222^{\circ}$  C. When the last named is treated with hypobromite solution, cedrene dicarbonic acid,  $C_{14}H_{22}O_4$ , a thick fluid oil, is obtained. By treating cedrene with hydrobromic acid and amorphous phosphorus, and reducing the product with sodium and alcohol, dihydrocedrene,  $C_{15}H_{26}$ , is obtained.—Pharm. Journ., Jan. 25, 1908, 89; from Berichte, 40 (1907) 3521.

*Champaca Oil*—*Source and Composition*.—Schimmel & Co. mention that they have received some interesting information concerning the origin of champaca oil, which they described in their October Report of 1906 (see Proceedings, 1907, 874), from the manufacturer, Mr. Anderson. It appears from this that this rare oil is obtained from two different species of *Michelia*, of which one, *Michelia longifolia*, bears white blossoms, the other, *Michelia champaca*, yellow blossoms. Both of these are distilled together, the white blossoms being in preponderance. The constants of this oil having been previously described in the report above referred to, the present reference deals only with the determination of the constituents. The lower-boiling portion ( $68^{\circ}$ – $83^{\circ}$  C.), after repeated fractionating, yielded about 60 per cent. of pure *linalool*. From the higher-boiling fractions ( $70^{\circ}$ – $155^{\circ}$  C. at 5 Mm. pressure), which had a particularly pleasant odor, neither ketones nor aldehydes could be isolated, but by treatment with phthalic acid anhydride a small quantity of *geraniol* was abstracted. The presence of *eugenol methylether* was shown to be probable in the fraction melting at  $248^{\circ}$ – $255^{\circ}$  C. The lowest-boiling portions of champaca oil, also unimportant in quantity, are characterized by a fruity odor, and consist of esters of *methyl ethyl acetic acid*, and also of this acid in the free state—the esters being apparently those of methyl or

ethyl alcohol, but these alcohols have not been identified with certainty.—Schimmel's Rep., Oct., 1907, 32-34.

*Oil of Chenopodium—Superior Anthelmintic Value.*—H. Brünning's experiments on children have confirmed that the oil of American wormseed (*Chenopodium anthelminticum*, L.) does not only deserve to rank side by side with santonin as its equal, but that disturbances which have always to be taken into account when santonin is administered, never occur in a manner worth mentioning if wormseed oil is taken as an anthelmintic. The dose for children, according to age, is 0.5 to 1.0 Gm. on 3 successive mornings, followed subsequently by castor oil.—Schimmel's Rep., Oct., 1907, 99; from D. Med. Wschr., 1907, No. 11.

*Oil of Cinnamomum Pedunculatum—Components and Constants.*—In their Report of April, 1907, Schimmel & Co. referred to the work of S. Keimazu and S. Asahina on the oil from the bark of *Cinnamomum pedunculatum*, Nees. (see Proceedings, 1907, 874). They now give the results of their own examination of a sample of this oil received direct from Japan. It had a bright yellow color; sp. gr., 0.9316 at 15° C; opt. rot.,  $-14^{\circ} 32'$ ; not completely soluble in 10 vol. of 70 per cent. alcohol; soluble in 1.2 and more vol. of 80 per cent. alcohol. The oil contains about 6 per cent. of phenols, which possess a cresol-like odor; the non-phenols contain phellandrene, and probably linalool.—Schimmel's Rep., Oct., 1907, 34.

*Citronella Oil—A Dextro-rotatory Kind from Java.*—Schimmel & Co. call attention to a sample of citronella oil received from Dr. Tromp de Haas, of Buitenzorg, which was distilled by a planter there from citronella grass, and is remarkable on account of its optical dextrorotation ( $\alpha_D + 0^{\circ} 10'$ ) since Java oils usually show exclusively a slight lævo-rotation. In other respects no difference could be detected. Schimmel & Co. mention, however, that they have also received several dextrorotatory Java oils from other quarters, which behave exactly in the same manner; their dextrorotation amounted up to  $+1^{\circ} 47'$ .—Schimmel's Rep., April, 1908, 32.

*Oil of Clove Leaves—Properties.*—Schimmel & Co. describe an oil of clove leaves originating from the Seychelles. It resembles ordinary oil of cloves in color and odor, contained about 87 per cent. of eugenol, and had the following constants: Sp. gr., 1.0493 at 15° C.; opt. rot.,  $1^{\circ} 40'$ ; index of refraction (20° C.), 1.53329; soluble in 1 or more vol. of 70 per cent. alcohol.—Schimmel's Rep., Oct., 1907, 37.

*Oil of Coriander—Products from Worm-eaten and Sound Fruits.*—Adolph W. Miller reports the results of steam distillation of oil of coriander at 150° F. in a vacuum of twenty inches, from 40 pounds of a mixture of one-third worm-eaten and two-thirds sound Mogador coriander fruit, which yielded a scarcely appreciable quantity of oil, the water merely becoming saturated with oil. Using this saturated water for a second and

third charge consisting of 40 and 30 pounds respectively of crushed Mogador fruit in fair condition, the total yield of oil of coriander was 890 grains, being equivalent to 0.18 per cent. from the last 70 pounds. The oil so obtained is readily soluble in 3 vols. 70 per cent. alcohol, and in 80 and 90 per cent. alcohol at 77° F. in all proportions, in so far complying with the U. S. P. Its sp. gr. is 0.883 at 77° F., the U. S. P. requiring a sp. gr. of 0.863 to 0.878.—*Amer. Journ. Pharm.*, Jan., 1908, 15-16.

*Eugenol and Isoeugenol—Action of Oxydases.*—H. Cousin and H. Hérissé communicate some results obtained by submitting eugenol and isoeugenol to the action of ferments from fungi. Under the influence of these oxydases eugenol is dehydrated, and forms dehydro-dieugenol,  $C_{10}H_{12}O_4$ , in well-formed, colorless crystals, melting at 105° C. It is soluble in alkalies, and forms benzoic and acetic esters. The same body is formed by the action of very dilute ferric chloride on solutions of eugenol. Isoeugenol, under similar conditions, furnishes an analogous compound, which is under investigation.—*Pharm. Journ.*, June 27, 1908, 330; from *Journ. de Pharm. et Chim.*, 27, (1908), 500.

*Curcuma Oil—Chemistry.*—Curcuma oil distilled from the raw root has been subjected to a detailed chemical examination by Rupe, Luksch and Steinbach. The oil had a specific gravity of 0.913 at 20° C., and yielded a fraction amounting to 80 per cent. between 150° and 160° C. (10 Mm. press.). On boiling this with dilute soda liquor, an oxygenated body of the b. p. 156° C., (12 Mm. press.), was obtained, and on boiling this, or the crude oil itself, with strong soda liquor, the author obtained in addition to a phenol of the m. p. 73° C., a ketone ( $C_{13}H_{18}O$ ), which is isomeric with the *tumerol* isolated from the oil by Jackson and Menke. The colorless ketone, amounting to 50 per cent. of the crude oil, when regenerated from the semicarbazone, had the b. p. 120° to 120.5° C. (10 Mm. press.), sp. gr., 0.9508 at 20° C., and possessed strong optical activity. Derivatives obtained were: an oxime, phenylhydrazone, bromophenylhydrazone, benzylidene compound, and a piperonal derivative; among the oxidation products were: terephthalic acid, *p*-methylacetophenone, an oxyacid  $C_{12}H_{16}O_3$ , and an acid  $C_{12}H_{14}O_3$ , the latter yielding on further oxidation with permanganate a dicarboxylic acid  $C_{12}H_{14}O_4$ . Phellandrene, previously discovered by the authors in the oil, was detected in the first runnings of the product split off from the oil.—*Schimmel's Rep.*, April, 1908, 36-37; from *Ber. d. D. Chem. Ges.*, 40 (1907), 4909.

*California Eucalyptus Oils—Development of the Industry.*—Professor Edward Kremers traces the development of the cultivation of eucalyptus trees and of the industrial production of eucalyptus oil in California, from which it appears that the first reference to American eucalyptus oil was made in 1887, although for several years previously (since 1884) the oil

of *Eucalyptus globulus* had been obtained in California as a by-product in the manufacture of an anti-incrustator for boilers, as much as several thousand kilos of an excellent oil, rich in cineol, having been derived from this industry during the period named. For several years past Prof. Kremers has come into touch with several distillers of eucalyptus oil, from which it appears that of seven or eight distillers so engaged only two obtain their product from *Eucalyptus globulus* leaves exclusively, and only one of them, F. E. Schueddig, of Los Angeles Co., has established a direct trade with pharmacists, supplying a pure oil at a reasonable figure. Samples of California oils, from different sources are now under examination.—Pharm. Rev., June, 1908, 177-184.

*Oil of Eucalyptus—Determination of Eucalyptol (Cineol) by the Aid of Resorcinol.*—Of the various methods that have been worked out for the estimation of eucalyptol in eucalyptus oils, the hydrobromic acid method and the phosphoric acid method are the best known, the latter being the one adopted by the U. S. P. VIII, for the purpose of testing eucalyptus and cajuput oils. Briefly, these consist in chilling the petroleum ether solutions of the oil, adding absolutely dry gaseous hydrobromic acid or concentrated phosphoric acid as long as a crystalline compound of cineol with the respective acids ( $C_{10}H_{18}O \cdot HBr$ , or  $C_{10}H_{18}O \cdot H_2PO_4$ ) is precipitated, washing the precipitate with petroleum ether and, finally decomposing it by the addition of water, when the cineol (eucalyptol) separates on the surface of the water and may be measured. Schimmel & Co., who describe the two methods in detail, find that with the "phosphoric acid (U. S. P.) method," a really correct result is a matter of chance and the method consequently unreliable and useless. With the aid of "hydrobromic acid" partly correct results were obtainable, but without being able to obviate in some cases quite considerable losses. They have now found that "resorcinol" is a more suitable substance for the quantitative separation of cineol from the oils, the determination being carried out as follows: 10 Cc. of the oil are mixed in a cassia flask of 100 Cc. capacity with so much 50 per cent (aqueous) resorcinol solution that the flask is about  $\frac{4}{5}$  filled. The mixture is shaken thoroughly for 5 minutes, and the oily portions are brought into the neck of the flask by adding more resorcinol solution, when their volume may be read off. By subtracting this volume from 10, the cineol content (which remains dissolved in the resorcinol solution) is ascertained, and its percentage in the oil is then obtained by multiplication with 10. Oils very rich in cineol should be diluted with an equal volume of turpentine oil, as otherwise the "cineol-resorcinol" might crystallize out and cause the whole of the mixture to solidify.—Schimmel's Rep., Oct., 1907, 45-50.

*Cineol—Determination in Eucalyptus and Cajuput Oils.*—Hoping that the new method proposed by Schimmel & Co. for the determination of

cineol in eucalyptus and cajuput oils (see preceding abstract), would give more accurate results than the phosphoric acid method of Scammell, which is condemned by them as being totally unreliable. C. T. Bennett has experimented with the new method proposed, but finds it to give results which are quite misleading. Thus in the case of a eucalyptus oil showing 65 per cent. cineol by the phosphoric acid method, he found that the resorcinol solution absorbs 82 per cent., while samples of cajuput oil showing 48 to 52 per cent. cineol by the phosphoric acid method, indicated 80 to 84 per cent. by the proposed new method. In his experience the phosphoric acid method had given very fair results within certain limits, but in the case of oils deficient in cineol—that is, when the content is less than 50 per cent.—a lower indication than the true value is obtained, owing either to the incomplete absorption by the phosphoric acid or to the dissociating effect of the terpenes on the phosphoric-acid compound. Fractionation is a useful method of checking the result, the portion distilling between  $175^{\circ}$  and  $185^{\circ}$  C. being sufficiently accurate for the purpose, although it is necessarily influenced by the character of the other constituents of the oil.—Chem. & Drugg., Jan. 11, 1908, 55.

*Geranium Oil—Adulteration with Gurjun Balsam.*—Some time ago Schimmel & Co. received a geranium oil for examination, which had abnormal constants, viz.:  $d_{15}^{\circ}$  C., 0.9050;  $a_D$ ,  $-28^{\circ} 26'$ ; ester number, 43.0; ester number after acetylation, 176.5; 55.9 per cent. geraniol; insoluble in 70 per cent. alcohol. By repeated extraction with 70 per cent. and 80 per cent. alcohol, gurjun balsam was isolated, and identified by its specific gravity and the optical rotation. A sample of

*Gingergrass oil*, received in the autumn of last year (1907), also proved to be grossly adulterated with gurjun balsam. This oil was absolutely insoluble, even in 90 per cent. alcohol.—Schimmel's Rep., April, 1908, 56.

*Oil of Hamamelis Virginiana* is the subject of a paper by Wilbur L. Scoville, in the "Proceedings" of this Association, 1907, 448-449.

*Oil of Heracleum Giganteum—Characters and Yield from Seed.*—Schimmel & Co. obtained 2.94 per cent. of volatile oil by distillation from the dry seed of *Heracleum giganteum*, which showed the following constants:  $d_{15}^{\circ}$  C., 0.8738;  $a_D$ ,  $+1^{\circ} 0'$ ;  $n_{D20}^{\circ}$  C., 1.42402; acid number, 3.7; ester number, 281.9; ester number after acetylation, 311.8; soluble in 1.2 and more vols. 80 per cent. alcohol.—Schimmel's Rep., April, 1908, 57.

*Hyssop Oil—Chemistry.*—The very meagre data regarding the chemical composition of hyssop oil have induced Schimmel & Co. to undertake a detailed examination of a normal oil of their own distillation, which, although not yet completed, led to some results of general interest. Oils were distilled from the dry blossoming herb, the withered blossoming herb, and from the faded herb which had ceased blossoming—the latter being used for the examination. This had the following constants:

$d_{15}^{\circ} \text{C.}$ , 0.9336;  $a_D$ ,  $-20^{\circ} 26'$ ;  $n_{D20}^{\circ} \text{C.}$ , 1.48441; acid no., 1.8; ester No., 3.1; soluble in 7 and more vols. 80 per cent. alcohol with slight turbidity (separation of paraffin). After repeated fractional distillation, the lowest boiling fractions were combined and distilled several times over sodium. Three fractions were thus obtained, amounting respectively to 3.1, 5.6, and 2.6 per cent. of the oil, which had a turpentine-like odor, and on oxidation with permanganate in the presence of NaOH, yielded abundant quantities of sodium nopinate. They consequently contained  $\beta$ -pinene (nopinene), which was thus for the first time detected in larger quantity in an essential oil. The *nopinic acid* was isolated and identified. The cineol, detected by Genouesse and Verrier, could not be detected in appreciable quantity, nor could a content of thujone and thujyl alcohol be proved. The principal constituent of the oil (about 45 per cent.), to the contrary, is a *saturated ketone* ( $\text{C}_{10}\text{H}_{18}\text{O}$ ) with a thujone and camphor-like odor. It was further possible to detect a very small quantity of an alcohol with pleasant odor, boiling at  $221^{\circ}$ – $222^{\circ} \text{C.}$  The higher boiling portions of hyssop oil appear to consist of compounds of the sesquiterpene series, which require further examination.—Schimmel's Rep., April, 1908, 57–61.

*Oil of Juniper*—"What is Properly So-called"?—Two papers were read at the British Pharmaceutical Conference in 1907 in which the respective authors aim to clear up some of the differences observed between English and foreign oil of juniper. F. C. J. Bird suggests as a possible explanation that the English oil consists of the entire distillate from the juniper berries, whereas the imported oil may be the lighter portion of the oil separated by redistillation. This would afford a product free from color and approaching the lighter limit of sp. gr. in the B. P., and might also allow a profitable disposal of the more odorous residue for flavoring purposes, concentrated or terpenless oil of juniper being an article of commerce in Germany, and doubtless finding an extensive application in the manufacture of Hollands and other spirits. The theory is supported by the results of the steam distillation of some English oil which yielded 70 per cent. of a colorless oil, sp. gr. 0.868, very similar in odor to the foreign oil, and about 12 or 15 per cent. of an oil possessing a concentrated juniper odor. In the second paper, entitled

*What is Oil of Juniper?*—John C. Umney and C. T. Bennett observe that there appears to be as much difference between the juniper oil distilled on the Continent, principally in Hungary, from the freshly picked berries (possibly not entirely free from leaves and twigs), and the oil distilled in England, from the berries which have naturally become partially dried, as there is between the patent still whisky and the malt whisky, which has been so much in evidence latterly in the courts of law. There is also doubt as to whether the valuable properties of juniper oil are due

to the terpene constituents which one finds in a larger proportion in the imported oil distilled in Hungary, or to the heavy constituent, cadinene, which one finds in the greater proportion in the English distilled oils, and the presence of which so modifies the physical characters of the oil. Briefly, the characters of these two classes of oils may be set out as follows:

	English.	Foreign.	U. S. P., 25° C.
Specific gravity.....	0.870 to 0.900	0.860 to 0.880	0.860 to 0.880
Optical rotation.....	-10° to +1°	-3° to -12°	—
Refractive index.....	1.4820 to 1.4880	1.4770 to 1.4830	—

The authors describe the characters and give fractionation figures for English and foreign oil of juniper which show very marked differences. Assuming that the medicinal value of the oil is due to one constituent, the authors conclude that the medicinal value must be widely different in the two classes. In spite of the differences noted, the oil of both classes might easily fall within the B. P. limits for specific gravity, and if freshly distilled the solubility also, and yet the proportion of pinene would probably vary from 30 to 65 per cent. Until the active constituent can be defined it is impossible to state exactly what tests should be applied to the oil. They suggest limits on broad lines, and say that it is practically impossible to decide from analytical figures to what extent, if any, rectified oil of turpentine has been added to a given sample.—Trans. Brit. Pharm. Conf. (Year-book of Pharmacy), 1907, 373-378.

*Oil of Juniperus Phænicea, L.—Constituents.*—In continuation of his studies of the oil of *Juniperus phænicea*, L. (which is frequently mistaken for oil of sabin), J. Rodié, having in the previous paper dealt chiefly with the composition of the terpene fraction of this oil, constituting 92.3 per cent. (see Proceedings, 1907), now reports on the constituents of the fraction boiling above 180° C., which represents 6.51 per cent. of the oil. This fraction forms a brown-red viscid liquid with a peculiar odor, reminding of juniper, and is composed almost entirely (= 6.37 per cent.) of *ester*,  $\text{CH}_3\text{COOC}_{10}\text{H}_{17}$ , corresponding to 25.17 per cent. *alcohol*,  $\text{C}_{10}\text{H}_{18}\text{O}$  (= 5.03 per cent. combined and 20.14 per cent. in the free state). Small quantities of an *aldehyde*, amounting to 0.0166 per cent. of the oil, were also isolated, but not identified with any known aldehyde, and apparently absent in the oil from other species of *Juniperus*. The presence of *acetic acid* was also established, while *caproic acid* could be detected in the fraction boiling at 190°-210° C. at 732 Mm. pressure.—Schimmel's Rep., Oct., 1907, 89-90; from Bull. Soc. Chim., iv, 1 (1907), 493.

*Oil of Juniperus Chinensis—Chemistry.*—According to examinations by

H. Kondo, the volatile oil of *Juniperus chinensis* appears to resemble very much, from a chemical point of view, the oil of *Juniperus virginiana*. The cedrol and cedrene isolated were chemically identical with those isolated from *J. virginiana*, but in their physical properties they differed rather considerably.—Schimmel & Co.'s Rep., Oct., 1907, 57; from Journ. of the Pharm. Soc. of Japan, 1907, 236.

*Oil of Lavender—Influences Concerned in the Ester-Content.*—In continuation of earlier work in the same direction, Jeancard and Satie communicate the results of their observations since 1900 on the influence of the altitude, the distillation, and the water used in the latter, on the ester-content of lavender oils. They arrive at the conclusion that the altitude does not appear to have any special influence on the ester-content and perfume, but that the progress of the distillation, and the quality of the water have an important bearing on the ester-content. In order to obtain an oil as rich as possible in esters, it is necessary to distil as rapidly as possible, preferably with steam. If the latter cannot be done, it is at least desirable to use water which on evaporation leaves only a very insignificant residue, as the salts contained in the water have a saponifying effect on the esters.—Schimmel's Rep., April, 1908, 63; from Bull. Soc. Chim., iv, 3 (1908), 155.

*English Lavender Oil—Abnormal Specimen.*—C. M. W. Grieb has recently examined a quantity of English lavender oil in which the following factors were determined:

Specific gravity at 15° C.....	0.8798
Optical rotation.....	—9.1°.
Percentage of ester.....	6.5

Quite insoluble in three times its volume of 70 per cent. alcohol, and hardly dissolving in ten times its volume.

This oil had an exceedingly fine aroma, far better than any B. P. oil the author had met with for a very long time; but the abnormally low specific gravity and solubility led to the suspicion that it might be adulterated with oil of turpentine. The absence of the latter was, however, proved by fractionation. This abnormal oil is most probably the first distillate, resulting from the practice of collecting the distillates in two portions.—Chem. & Drugg., April 4, 1908, 537.

*Oil of Lavandula Stoechas—Constituents.*—Schimmel & Co., in continuation of an examination of an oil distilled by them from *Lavandula Stoechas* (see Proceedings, 1906, 879), have detected in a fraction boiling at 195° to 201° C., *d-fenchone* (m. p. of the oxime 165° C.), but it must be an open question whether besides fenchone *fenchyl alcohol* is not present as well, which on treatment of the fraction in question with nitric acid had been oxidized into fenchone. One of the principal constituents



of the oil, as previously stated, is *d-camphor*.—Schimmel's Rep., April, 1908, 62.

*Lemon Oil—Adulteration with Petroleum*.—Ernest J. Parry has examined four typical samples of abnormal lemon oil which has recently appeared on the market. It is characterized by being very insoluble in absolute alcohol, and showed the constants exhibited in the following table :

Sample.	Sp. Gr. at 15° C.	Optical Rotation.	Refractive Index.	Citral.
				Per Cent.
1 .....	0.8590	+37°	1.4620	1.8
2 .....	0.8595	+35°	1.4595	1.7
3 .....	0.8585	+29°	1.4600	1.5
4 .....	0.8590	+33°	1.4616	1.6

On fractionation, the first three fractions (respectively 10, 10 and 30 per cent.) proved in each case to consist of lemon terpenes. The residual 50 per cent., containing a certain amount of citral, was obviously petroleum,\* probably the ordinary odorless, heavy white oil, with possibly some lemon terpenes.—Chem. & Drugg., Febr. 15, 1908, 275.

*Lemon Oil—Adulterations*.—Schimmel & Co. note several adulterations of oil of lemon recently observed by them. The adulterated oil in one instance was a colorless distilled oil, leaving 4.1 per cent. of residue on evaporation. In two other cases the adulterant was alcohol, which could be and was separated, and probably containing also some oil of turpentine. Though obtained from different quarters, these were apparently of the same origin, in spite of the fact that they showed slight differences. A fourth oil, from Hamburg, was found to be adulterated to the enormous amount of 41.0 per cent. with paraffin oil. The presence of the latter does not always affect the specific gravity, but causes a lowering of the optical rotation and, of course, increases the residue of evaporation.—Schimmel's Rep., April, 1908, 45.

*Cyclolimonylidenepropenal—A New Violet Odor from Citral*.—According to T. Barbier, citral undergoes condensation when treated, in the presence of dilute sodium hydroxide solution, with dilute alcoholic solution of propyl aldehyde. A mixture of two odorless isomeric unsaturated

\* A similar adulteration of lemon oil was observed by me forty years ago, and communicated to the Am. Journ. Pharm., 1867, 387-388 (see Proceedings, 1868, 178).—C. L. D.

aldehydes is obtained, having the common formula  $\text{CH}_3\text{C}(\text{CH}_3) : \text{CH} \cdot \text{CH}_2 \cdot \text{CH}_2 \cdot \text{C}(\text{CH}_3) : \text{CH} \cdot \text{CH} : \text{C}(\text{CH}_3) \cdot \text{CHO}$  or  $\text{C}_{13}\text{H}_{20}\text{O}$ . One of these distills between  $147^\circ$  and  $148^\circ$  C. under 13 Mm. pressure, the other between  $158^\circ$  and  $160^\circ$  C. When these two aldehydes are poured into cold 60 per cent. sulphuric acid, and the mixture is warmed for a few minutes to  $50\text{--}60^\circ$  C., cyclolimonylidenepropenal is formed, or two isomeric forms thereof, with the respective boiling-points  $123\text{--}125^\circ$  C. and  $132\text{--}133^\circ$  C. under 13 Mm. The mixed aldehydes form an amber colored, somewhat oily liquid with an intense odor of fresh violet flowers, much surpassing that of ionone in intensity and freshness. On account of the ease with which it oxidizes, however, it cannot be used technically as a substitute for ionone.—Pharm. Journ., Nov. 16, 1907, 641; from Compt. rend., 144, 1442.

*Volatile Oil of Lippia Scabberima, Sonder—Characters.*—Frederick Power and Frank Tutin have obtained by steam distillation, from the leaves and stems of *Lippia scaberrima*, Sonder (which see under “Materia Medica”), 0.25 per cent. of aromatic volatile oil having the following properties: A yellow-brown liquid, distilling under ordinary pressure completely between  $220^\circ$  and  $230^\circ$  C., having a distinct camphoraceous odor, resembling that of the plant; readily soluble in 70 per cent. alcohol, the solution giving a light-brown color on addition of ferric chloride; sp. gr. at  $15^\circ/15^\circ = 0.950$ ; optical rotation,  $+7^\circ 36'$  in a 1 dcm. tube.—Arch. d. Pharm., 245 (1907), No. 5, 339.

*Magnolia Oil—Properties of a Japanese Product.*—Schimmel & Co. have received from Japan a sample of oil, designated simply as “magnolia oil,” without further specification. It was a limpid, bright yellow liquid, having the following constants: Sp. gr., 0.9100 at  $15^\circ$  C.; opt. rot.,  $+14^\circ 10'$ ; soluble in about 7 and more vols. of 80 per cent. alcohol with minute turbidity. Of constituents, cineol and phellandrene were detected, but the oil probably contains also linalool and terpineol. According to the results of this examination, it appears out of the question that this magnolia oil is identical with the “kobushi oil” from *Magnolia kobus*, D. C., described in a previous report (1903).—Schimmel's Rep., Oct., 1907, 101.

*Volatile Oil of Magnolia Kobus—Composition and Characters.*—E. Charabot and G. Laloue found anethol to be the main constituent, in addition to about 15 per cent. of citral, of the volatile oil of the twigs of *Magnolia kobus*, indigenous to Japan. This oil had the following characters: Specific gravity, 0.9432;  $[\alpha]_D -1^\circ 20'$ ; soluble 1:1 in 90 per cent. alcohol, with opalescence on adding more solvent.—Pharm. Journ., Feb. 22, 1908, 223; from Compt. rend., 146 (1908), 183.

*Kobushi Oil—Chemical Constituents.*—Several years ago Schimmel & Co. reported the results of an examination of kobushi oil (see Proceedings, 1904, 866), but were at that time unable, through lack of material,

to make a complete examination. Having since received from Japan a quantity of this oil, distilled from the young twigs and leaves of *Magnolia kobus*, D. C., they have made a more detailed examination and obtained results which confirm those recently obtained by Charabot and Laloue (see preceding abstract). The sample had the following constants:  $d_{40}^0$ , 0.9451;  $a_D$ ,  $1^\circ 32'$ ; acid No., 0.7; ester No., 4.3; soluble in 10 vols. 80 per cent. alcohol with turbidity, and in 0.5 vol. 90 per cent. alcohol, becoming faintly opalescent on dilution. The oil contains besides *citral* and *cincol* about 16 per cent. of *anethol*, and probably also some *methyl chavicol*.—Schimmel's Rep., April, 1908, 61–62.

*Myrtle Oil—Chemistry of Myrtenol*.—The alcohol "myrtenol" discovered some time ago by v. Soden and Elze in myrtle oil (see Proceedings, 1906, 881), has been examined more in detail by Semmler and Bartelt. In order to obtain it, the high-boiling portions of myrtle oil were saponified, then fractionated, and the alcohol isolated by means of the phthalic acid compound. It has the composition  $C_{10}H_{16}O$ , and possesses the following properties: b. p.,  $102.5^\circ C.$ , at 9 Mm. pressure,  $222^\circ$  to  $224^\circ C.$ , at atmospheric pressure; sp. gr., 0.7963 at  $20^\circ$ ; opt. rot.,  $+45^\circ 45'$ ; index of refract., 1.49668; mol. refract., 45.46 (calculated for  $C_{10}H_{16}O = 45.04$ ). From the molecular refraction the authors conclude that myrtenol has a bicyclic character. By means of phosphorus pentachloride, "myrtenyl chloride,"  $C_{10}H_{15}Cl$ , was obtained, and this by reduction with alcohol and sodium yielded, besides "myrtenol ethyl ether,"  $C_{10}H_{15}OC_2H_5$ , a highly dextro-rotatory "pinene" ( $+28^\circ C.$ ), the identity of which was proved by the well-known derivatives. By oxidizing myrtenol with chromic acid in solution with glacial acetic acid, the aldehyde "myrtenol,"  $C_{10}H_{14}O$ , was obtained, and this could be converted over the oxime and nitrite into "myrtenic acid,"  $C_{10}H_{14}O_2$  (m. p.  $54^\circ C.$ ). When boiled with 10 per cent. sulphuric acid, myrtenol yielded a hydrocarbon,  $C_{10}H_{14}$ , which is possibly "cymene."—Schimmel's Rep., Oct., 1907, 64; from Berl. Berichte, 40 (1907), 1363.

*Oil of Nardostachys jatamansi (?)—Characters and Constants*.—Y. Asahina has isolated from the drug *Kansho-ko*, which is popular in Japan as a perfume, and which is probably the rhizome with attached rests of leaves of *Nardostachys jatamansi*, D. C., 1.9 per cent. of a greenish-yellow, pleasantly odorous oil, which readily resinifies on exposure to the air. It had the sp. gr. 0.9536 at  $15^\circ C.$ ; opt. rot.,  $-11^\circ 30'$ ; index of refract. ( $8^\circ C.$ ), 1.571; acid number, 0; saponification number, 45.7; saponification number after acetylation, 66.42. It contains a sesquiterpene having a b. p. of  $250^\circ$  to  $254^\circ C.$ , and sp. gr. 0.932 at  $15^\circ C.$ .—Schimmel's Rep., Oct., 1907, 65; from Journ. of the Pharm. Soc. of Japan, 1907, 355.

*Niaouli Oil—Characters and Constants*.—Schimmel & Co. describe a New Caledonian oil, received under the name of "niaouli oil," which is

derived from *Melaleuca viridiflora*, Brongn. et Gris., and closely approaches cajuput oil. It has a bright lemon-yellow color and a powerful odor of eucalyptol, of which it contains about 40 per cent., and differs from the (cajuput ?) oils otherwise met with in the trade by the distinctly higher specific gravity, which lies usually between 0.906 and 0.922, whereas the present sample has the sp. gr. 0.9284 at 15° C. Other constants found are:  $a_D$ ,  $-1^\circ 10'$ ; soluble in 5.5 or more vols. 70 per cent. alcohol, and 1 and more vols. 80 per cent. alcohol.—Schimmel's Rep., April, 1908, 72.

*Oil of Nutmeg—Chemical Constituents.*—F. B. Power and A. H. Salway, with the object of clearing up the nature of the individual constituents of nutmeg oil and especially of the "myristicol" of Wright, the existence of which has become extremely doubtful, have made a comprehensive chemical examination of nutmeg oil, specially distilled for their investigation from Ceylon nutmegs of good quality and free from lime. The yield was 6.94 per cent. of oil having the following constants:  $d_{40}^{25}$ , 0.8690;  $a_D$ ,  $+38^\circ 4'$ ; acid No., 0.81; ester No., 3.15 corresponding to 1.1 per cent.  $C_{10}H_{17}C_2H_5O_2$ ; soluble in 3 vols. 90 per cent. alcohol. The chemical constituents determined by this investigation were the following: Eugenol and isoeugenol (about 0.2 per cent.), d-pinene and d-camphene (about 80 per cent.); dipentene (about 8 per cent.); d-linalool, d-borneol, i-terpineol and geraniol (about 6 per cent.); small quantities of a new alcohol which on oxidation yields a diketone  $C_8H_{14}O_2$ ; traces of a citral-like aldehyde whose  $\beta$ -naphtho cinchoninic acid melts at 248° C.; saffrol (about 0.6 per cent.); myristicin (about 4 per cent.); myristic acid free (about 0.3 per cent.), and a small quantity as ester; further, esterified, small quantities of formic, acetic, butyric, and octylic acids, and a new mono-carboxylic acid,  $C_{13}H_{18}O_2$ . The authors conclude that that portion of the oil which has hitherto been designated as "myristicol," is a mixture of alcohols, of which terpineol appears to be the principal component.

In their comments on the above, Schimmel & Co. mention that the very low specific gravity and the exceptionally powerful rotation of the oil examined by Power and Salway, point to the fact that they have worked up an oil which was extremely rich in terpenes; in many oils of nutmeg the content of oxygenated constituents is probably larger than that indicated above.—Schimmel's Rep., April, 1908, 74-76; from Journ. Chem. Soc., 91 (1907), 2037.

*Oleum Menthae Viridis Ang.—Characters and Constants.*—H. J. Henderson communicates the following characteristics of two samples of English oil of spearmint distilled by W. Ransom and Son, Hitchin, from herb grown by them. A specimen of the plant was submitted to Mr. E. M. Holmes, who identified it as "the ordinary *Mentha viridis*, the whorls of flowers being a little less distant than usual." The oil distilled in 1906 had a specific gravity of 0.931, and was soluble in its own volume of 90

per cent. alcohol. The angle of rotation in 100 Mm. tube was  $-50^{\circ} \alpha_D$ , temperature of room  $21.5^{\circ} \text{C}$ . The oil distilled in 1907 had a specific gravity of 0.927, and was soluble in its own volume of 90 per cent. alcohol. The angle of rotation in a 100 Mm. tube was  $-50^{\circ} \alpha_D$ , temperature of room  $20^{\circ} \text{C}$ .—Pharm. Journ., Oct. 19, 1907, 506.

*Oil of Peppermint—Adulteration with Petroleum.*—Ernest J. Parry says that large quantities of peppermint oil are just now being sold in London and the provinces which contains white petroleum as an adulterant. The following figures represent five samples of this oil :

Sp. Gr.	Opt. Rot.	Menthol.	Petroleum Separated.
0.892	$-13^{\circ}$	31 per cent.	46 per cent.
0.891	$-12^{\circ}$	29 per cent.	44 per cent.
0.893	$-14^{\circ} 30'$	29.5 per cent.	48 per cent.
0.8875	$-14^{\circ}$	29 per cent.	49 per cent.
0.895	$-13^{\circ}$	31 per cent.	45 per cent.

It should be remembered that, in addition to the fact that this oil is adulterated, the adulteration is one which has been held to be injurious to health.—Chem. & Drugg., May 16, 1908, 770.

*English Oil of Peppermint—Temperature of Menthol Separation.*—W. Elborne and C. M. Warren, in the course of applying the B. P. tests to reputed representative samples of genuine English (Mitcham) oil of peppermint, observed that on cooling the oil to  $17^{\circ} \text{F}$ . ( $-8.3^{\circ} \text{C}$ .), and adding a crystal of menthol, no separation of menthol occurred in five of six samples under examination, but that an abundant separation of menthol occurred when the temperature was reduced to  $8.6^{\circ} \text{F}$ . ( $-13^{\circ} \text{C}$ .), the oil becoming opaque and pasty, and ultimately semi-solid. Moreover, to attain this result, some fifteen or twenty minutes' exposure to the lower temperature, under constant stirring with a glass rod, was required; and, on removing the oil from the freezing mixture the opacity seemed regularly to disappear at about  $23^{\circ} \text{F}$ . ( $-5^{\circ} \text{C}$ .), which is only a few degrees above the pharmacopœial  $17^{\circ} \text{F}$ ., at which menthol should be separated.—Pharm. Journ., Sept. 14, 1907, 359.

*American Oil of Pennyroyal—Constituents.*—Marmaduke Barrowcliffe mentions the constituents identified by him in American oil of pennyroyal (*Hedeoma pulegoides*, L.), supplied by Fritzsche Brothers, N. Y., which had the following constituents: Sp. gr., 0.9297 at  $15^{\circ} \text{C}$ .; opt. rot.,  $+25^{\circ} 44'$ ; soluble in 2 vols. 70 per cent. alcohol. It contained, free acids :

formic, butyric, octylic, decylic; combined acids: salicylic, formic, acetic, octylic, decylic, and a non-volatile dibasic acid of the formula,  $C_8H_{14}O_4$  (m. p.  $83^{\circ}$ – $85^{\circ}$  C.): a phenol; pulegone (24.1 per cent.); *l*-pinene; 1-methyl-3-cyclo-hexanone (8 per cent.)—this ketone being detected for the first time in nature; *l*-limonene and dipentene—both in small quantities; *l*-menthone and *d*-menthone—together constituting 50 per cent. of the oil; and a sesquiterpene alcohol (2 per cent.), from which a sesquiterpene was separated.—Schimmel's Rep., Oct., 1907, 68; from Journ. Chem. Soc., 91 (1907), 875.

*Pilea Oil*—*Sabinene the Principal Constituent*.—In previous reports (see Proceedings, 1907, 885), Schimmel & Co. had given some preliminary information concerning a new volatile oil—pilea oil. Professor Semmler, to whom this oil was submitted for further examination, now reports that he has found the fraction of the b. p.  $167^{\circ}$  to  $168^{\circ}$  C., representing the bulk of the pilea oil, to be *sabinene* (sp. gr. 0.8402 at  $20^{\circ}$  C.), the identity of which was established by the formation of sabinene glycol on oxidation of the fraction with potassium permanganate. The latter had the b. p.  $150^{\circ}$ – $154^{\circ}$  C., at 9 Mm. pressure; sp. gr. 1.0332 at  $120^{\circ}$  C.; index of refract., 1.48519; mol. refract., 47.17 (calculated for  $C_{10}H_{18}O_2$  = 46.97).—Schimmel's Rep., Oct., 1907, 75.

*Pine Oils*—*Varieties on the English Market*.—C. T. Bennett briefly mentions and describes the pine oils which are now met with on the English market. Strictly speaking, the term pine oil includes two classes of oils—turpentine oils and pine oils from leaves and cones. Both classes of oils consist largely of pinene and allied hydrocarbons.

*Turpentine Oils* are obtained by steam distillation from the oleo-resin or direct from the wood of various conifers, principally *Pinus australis* (American), *Pinus sylvestris* (Russian), and *Pinus maritima* (French).

*Turpentine Substitutes*, which are more largely sold, contain light fractions of petroleum mixed with various proportions of turpentine (oil), and some consist entirely of petroleum distillates. Rosin oil and rosin spirit, prepared by distinctive distillation of rosin, are also used in the manufacture of cheap turpentine oils.

*Oils from Pine Leaves and Cones*, collectively known as "pine oils," are obtainable by the distillation of fresh leaves and young cones respectively of various species of *Pinus*, the oil from the leaves being known as "pine-needle oil." The principal varieties in English commerce are obtained from *Pinus pumilio* (*Pinus montana*) and *Pinus sibirica*. The true oil from *Pinus sylvestris*, formerly official in the B. P. (1885), is now practically unobtainable. The oil from the leaves of *Abies pectinata* (*Abies alba*, *Abies excelsa*), a very fragrant oil, is quite scarce. Other pine oils rarely met with are those of *Pinus excelsa*, *P. larix*, *P. maritima* and *P. strobus*. Oils of American origin are derived from *Pinus canadensis*, *P.*

*mariana* and *P. rubens*. The so-called "Templin Oil" is obtained from the cones of *Abies pectinata*.

The following tables show a comparison of the physical characters of the more important oils mentioned, as determined by the author, and represent a large number of samples extending over the last ten years :

TURPENTINE OILS.

—	Sp. Gr.	Opt. Rot.	Ref. Index (Average).	Portion Distilling Between 155° to 165° C.
American .....	0.865 to 0.868	+ 1° to + 6°	1.4765	80 to 85 p. c.
French .....	0.870 to 0.874	—31° to —35°	1.4805	75 to 90 p. c.
Russian (more variable) .	0.855 to 0.874	+ 5° to + 16°	1.4790	30 to 70 p. c.

PINE-NEEDLE OILS.

—	Sp. Gr.	Opt. Rot.	Ref. Index.	Esters.	Distilling Between 155° to 165° C.
<i>P. Pumilio</i> .	0.863 to 0.875	— 6° to —14°	1.4805	5 to 7 p. c.	0 to 12 p. c.
<i>P. Sibirica</i> .	0.901 to 0.920	—32° to —42°	1.4735	30 to 40 p. c.	5 to 10 p. c.
<i>P. Sylvestris</i> .	0.868 to 0.925	+ 5° to + 7°	1.4735	3 to 11 p. c.	40 to 65 p. c.

—Pharm. Journ., April 11, 1908, 483-484.

*Long Leaf Pine Oil—Terpineol a Constituent.*—J. E. Teeple finds that the oil distilled by steam from the "light wood" of *Pinus palustris*, that is, portions of the tree which had been cut at least three years and were very resinous, is colorless or pale yellow; specific gravity, 0.935 to 0.947. It begins to boil at about 206°–210° C.; 75 per cent. distils between 211°–218° C. The main constituent is lævo-terpineol. The oil has only recently acquired commercial importance, on account of its valuable solvent properties. It will dissolve the ordinary varnish gums in the cold, and is an excellent solvent for rubber. It may be mixed with nitrocellulose dissolved in amyl acetate without precipitating the nitrocellulose. When rectified, its pleasant odor renders it a very suitable perfume for soap. Probably this oil will prove a valuable source of terpineol, cheaper than that produced at present from terpin hydrate from oil of turpentine. This is the first recorded instance of the occurrence of terpineol in a coniferous oil.—Journ. Amer. Chem. Soc., 30 (1908), 411.

*Siberian and Other Pine-Needle Oils—Santene a Constituent.*—Aschau

has separated a hydrocarbon,  $C_9H_{16}$ , from Siberian pine-needle oil (present in the proportion of 3 to 4 per cent.), which was recognized as santene. A comparison of its constants with those of santene prepared from sandalwood oil, confirmed their identity. Santene was further detected in the needle oils of the German pine (*Pinus Picea*), of the German *Abies excelsa*, and in Swedish pine-needle oil.—Schimmel's Rep., April, 1908, 84-85; from Ber. d. D. Chem. Ges., 40 (1907), 4918.

*Siberian Pine Needle Oils—Constituents.*—In continuation of a former investigation of Siberian pine-needle oils (see Proceedings, 1905, 763), J. Schindelmeiser has recently succeeded in definitely demonstrating the presence of *dipentene*, in the fraction of the b. p.  $175^{\circ}$ – $182^{\circ}$  C., by producing the dihydrochloride, the dihydrobromide and the tetrabromide of this terpene. The constants of the terpene were: b. p.,  $176^{\circ}$ – $178^{\circ}$  C.; sp. gr., 0.847; opt. rot.,  $\pm 0$ ; index of refract., 1.47312. The presence of *d-phellandrene* was also proved by the formation of a crystalline nitrite, m. p.,  $106^{\circ}$ – $107^{\circ}$  C. The total quantity of the crude dipentene and phellandrene fraction together equaled 5.4 per cent. of the oil.—Schimmel's Rep., Oct., 1907, 76; from Chem. Ztg., 31 (1907), 759.

*Oleum Templinum—Preparation.*—Dr. Lüdy gives an interesting description of the preparation of the volatile oil of fir cones (oleum templinum), which appears to be the only volatile oil that is now distilled in Switzerland on a small scale, usually by peasants, who in individual cases may supply from 100 to 200 Kgm. of the oil in the fall of the year. This industry is confined exclusively to a few localities in the Canton of Berne. The oil is obtained only from the cones of *Abies pectinata* D. C.—the needles and twigs being carefully excluded, statements in this literature to the contrary notwithstanding. The green cones, rich in oil, are gathered during September, usually by hand—an operation attended with much trouble and some danger owing to the great height of the trees and the circumstance that the cones are found almost exclusively in the top-most branches. After crushing the cones with wooden mauls to liberate the oil-bearing seeds, whereby the yield of oil is materially increased, the copper pot-still provided with an alembic, is filled with the crushed cones and seeds, then covered with water and, the lutings having been effected with clay, heat is applied. The distillate is condensed in a copper worm-condenser, and collected in a peculiarly constructed glass receiver, having a hole in the bottom, which is closed with a wooden stopper made tight by the aid of a wrapper of cloth; this being lifted from time to time so that the accumulated water may be removed from the oil. A charge of 60 Kgm. of cones usually yields about 400 Gm of oil, but the yield is variable, depending on the weather, locality of growth, etc. When the operation is conducted with care, the oil has a fine odor, reminding of lemon and orange; but inferior qualities are produced if too little water



is used, or if the distillation is pushed too far, the oil acquiring an empyreumatic flavor.—Schweiz. Wchschr. f. Chem. u. Pharm., xlv (1907), No. 52, 818–819.

*French Rose Oil—Culture and Extraction.*—Schimmel & Co. review several communications concerning the cultivation of roses and experiments made on the extraction of oil, which have appeared in recent numbers of "La Vie à la Campagne" (1907, 414) and "La Revue de Grasse" (1907, Nos. 13, 16 and 17). In southern France the species of rose mostly cultivated at present is *Rosa damascena*, Mill., of which a local variety, "la Muscadine," is particularly popular. In addition to these the "Rose de Provins," a form of *Rosa gallica*, and *Rosa centifolia*, L., are also cultivated. They are chiefly worked up for rose water, and rose oil is only obtained as a by-product, the distillation being carried on as follows: 50 kilos flowers are added to 300 liters water, and from this 100 liters rose water are distilled off, from which, at most, 1 Gm. of oil separates. Recently trials have been made with two varieties of the Japanese rose, *Rosa rugosa*, Thunb., which are designated respectively as "Rose de l'Hay" and "Roseraie de l'Hay," after the township of l'Hay, where the first trials were made to extract the oil from these flowers. Like all Japanese roses they have large blossoms, and are generally strongly built and very hardy. These experiments have shown that an oil of exquisite quality can be obtained from the blossoms by extraction with low-boiling petroleum ether (sp. gr. below 0.630 at 15° C.). In this manner 8 Gm. of oil was obtained from 10 kilos of blossoms, which is considerably more than the yield of the rose now cultivated, whilst on distillation with steam 50 kilos of blossoms yielded, as in the distillation above mentioned, also only 1 Gm. of oil in addition to the rose water. The quantity of oil obtained by extraction amounts to 2.05 kilos per acre, equal to the value of 4000 francs, as compared with about 1500 francs' value of the oil and water obtained by distillation.—Schimmel's Rep., Oct., 1907, 78–80.

*Otto of Rose—Modern Methods of Adulteration.*—Ernest J. Parry observes that otto of rose is very heavily adulterated this season. Until recently a fairly pure geraniol with very high specific gravity and refractive index had taken the place of crude "Turkish" geranium oil as an adulterant of otto. But in anything more than very small quantities this could easily be detected. Now, however, some skilled chemist has prepared a geraniol (a mixture, of course, with other alcohols), having a specific gravity of about 0.875, and a refractive index of under 1.4700. To show how this affected a pure otto, he gives the following figures: No. 1 is a pure otto of rose of the best quality; the other samples are this otto with 5 per cent., 10 per cent., 20 per cent., and 30 per cent. of the new kind of "geraniol," added:

—	I.	+5 per cent.	+10 per cent.	+20 per cent.	+30 per cent.
Sp. gr. at 30°. . . . .	0.8550	0.8565	0.8575	0.8600	0.8618
Refractive index at 24° . . . . .	1.4619	1.4622	1.4629	1.4637	1.4648
Rotation . . . . .	-2° 38'	-2° 30'	-2° 20'	-2° 15'	-2° 5'
Melting-point . . . . .	23°	22.5°	21.59°	20.5°	20°
Melting of stearoptene . . . . .	34.5°	35°	34°	30°	33.5°

The melting-point of the stearoptene should, of course, be identical in each case; the slight differences are due to imperfect purification. By melting-point is meant the temperature at which the crystals of stearoptene disappear, a characteristic which depends not so much on the relative proportions of liquid and solid, but rather on the degree of insolubility of the stearoptene in the liquid. Hence the addition of large quantities of geraniol does not lower the melting-point by so much as might be expected. A careful examination of this season's otto of rose from numerous sources convinces him that the purest and best otto has a specific gravity not exceeding 0.8560, and a refractive index of under 1.4620.—Chem. & Drugg., Sep. 21, 1907, 475.

*English Oil of Rosemary—Optical Rotation.*—The conflicting statements concerning the optical rotation of genuine English oil of rosemary is the subject of an interesting paper by H. John Henderson, in which he demonstrates that this oil, distilled from fresh material grown in England, has been both lævogyre and dextrogyre in different seasons. Thus, an oil distilled by W. Ransom and Son under his own observation, rotated the plane of polarized light to the right 5° 4' when examined by the sodium flame in a 200-Mm. tube, the temperature of the laboratory being 19° C., while the distillates of the same firm during the past three years have shown the following characteristics:

—	Sp. Gr.	Optical Rotation 100-Mm. Tube.	Solubility.
1905	0.9029	-0° 24' at 20° C.	2 mls dissolved in 0.5 mil of 90 per cent. alcohol.
1906	0.9030	-0° 36' at 20° C.	2 mls dissolved in 0.6 mil of 90 per cent. alcohol.
1907	0.9038	-2° 48' at 14.5° C.	2 mls dissolved in 0.6 mil of 90 per cent. alcohol.

The oils are distilled from the fresh material immediately after cutting,

in contradistinction to foreign oils, which are distilled from the dried material, and to some so-called English oil which is distilled in England from dried material imported from abroad.—Pharm. Journ., Nov. 9, 1907, 599.

*Syrian Sage Oil—Constants.*—Schimmel & Co. have determined the constants of a Syrian oil of sage received from Jaffa, which, according to Dr. A. Ginzberger, is derived from *Salvia triloba*, L. It had the sp. gr. 0.9116 at 15° C.; opt. rot.,  $-3^{\circ} 28'$ ; ester number, 10.3, corresponding to 3.6 per cent. bornyl acetate; soluble in 15 to 16 and more vols. 70 per cent. alcohol, and in 1 and more vols. 80 per cent. alcohol. This oil differs from the Dalmatian oil of sage (from *Salvia officinalis*, L.), which it resembles in the odor, by the low specific gravity and the optical laevo-rotation, but it is apparently closely related to an oil from Palestine (see Mount Carmel Sage Oil, in Proceedings, 1906, 886) examined by Schimmel & Co. in 1905. Concerning

*Dalmatian Sage Oil.*—Schimmel & Co. observe that they had in a previous Report (Oct., 1895) stated that no camphor, but only borneol, was present as a constituent. On recently examining an oil of Dalmatian origin, however, they were surprised to find that the oil contained, besides borneol, chiefly d-camphor, which was identified by the melting-point of the oxime (118° C.). In consequence they have now distilled sage oils from Dalmatian herb, and their examinations of these confirm that both camphor and borneol are present in oil of sage, but that it may possibly depend upon the manner of the distillation whether the oil contains no camphor at all or only very little camphor. Thus, while the "normal oil" yielded no camphor out of any of the fractions coming under consideration, not even by cooling in a freezing mixture, the oil, designated for distinction as "water oil," obtained by cohobation from the distillation waters, and which contained the portions of the normal distillate which are readily soluble and suspended in water, readily yielded d-camphor from the fractions which passed over at from 60°–90° C.—Schimmel's Rep., Oct., 1907, 81–83.

*Santal Oil—Modification of U. S. P. Requirements.*—A. R. L. Dohme and H. Engelhardt publish the results of a study of East Indian sandalwood oil, from which they draw the following conclusions:

(1) That the optical rotation as given in the U. S. P. is too high, and should be changed to read  $-12^{\circ}$  to  $-20^{\circ}$  as in the main distillate.

(2) That the solubility in 70 per cent. alcohol is not a safe criterion, since an oil that contains 95 per cent. of santalol falls below the allowed standard, with a solubility of 1 to 6 instead of 1 to 5 volumes, and an oil that runs as high as 97.7 per cent. santalol is insoluble in 5 volumes of 70 per cent. alcohol.

(3) That although all the acid numbers are low and show freedom from

admixture of any adulteration, they serve no value as an indication of the quality of the oil; their purpose being, hence, only negative.—*Amer. Journ. Pharm.*, Feb., 1908, 51-55.

*True Sandalwood Oil—Cause of Abnormal Characters.*—Introducing his criticisms on some suggestions that the standards adopted for sandalwood oil are too stringent, and particularly those recently made by Dohme and Engelhardt (which see), Ernest J. Parry states that, although during the past fifteen years he has had opportunity to examine many hundreds of samples of sandalwood oil distilled by the leading English, German, Dutch and French distillers, of these hundreds of samples, he has until quite recently only found about half-a-dozen which did not comply with the usual official requirements. The half-dozen or so, all distilled by firms of the highest repute, differed from the official standards slightly in either specific gravity, optical rotation, or solubility. Such abnormal samples have been a little more frequent during the past year; but this can be quite reasonably explained by the information, received on excellent authority, that a considerable amount of very old and sometimes somewhat rotten wood has been disposed of by the government sellers during the past year or so, and that the abnormal oil in all probability is the product of such old or rotten wood.

In regard to Dohme and Engelhardt's strictures, Mr. Parry objects very strongly to lowering the standard of optical rotation to a minimum of  $-12^{\circ}$ . In his experience not one sample in fifty ever falls below  $-16^{\circ}$ , and to reduce the figures to  $-12^{\circ}$  would encourage the use of a little more of a favorite adulterant now used. The solubility tests of the U. S. P. and the B. P. also, are regarded by the author as very fair ones; and while he is glad to note that D. and E. place considerable reliance on the santalol value as a criterion of purity, he does not agree with them that the optical rotation and ester numbers are unimportant in judging the value of santal oil; on the contrary he considers them very useful for this purpose.—*Chem. & Drugg.*, Mar. 2, 1908, 489.

*Oil of East Indian Sandalwood—Constants Determined in Sixteen Authentic Samples of Genuine Oil.*—In a communication from the laboratories of W. J. Bush & Co., the results obtained in the examination of santal oil distilled by them from sixteen parcels of genuine East Indian sandalwood is given as follows: the number by which they are designated being here omitted as immaterial to the purpose of this report:

Sp. gr.	Opt. rot.	Soluble in Alcohol, 70 per cent.		Per cent. Santalol.	Per cent. Santalol Esters.	Acid No.
		At 15° C.	At 20° C.			
0.9754	-17.2°	4½ vols.	—	95.07	4.51	—
0.9715	-13.0°	insoluble in 10 vols.	* insoluble in 10 vols.	89.51	8.13	—
0.9844	-11.5°	insoluble in 10 vols.	—	90.93	9.64	—
0.9821	-12.0°	insoluble in 10 vols.	—	89.60	8.80	—
0.9708	-21.6°	4½ vols.	3½ vols.	97.33	1.35	1.6
0.9825	-17.0°	5½ vols.	4½ vols.	96.9	5.36	3.8
0.9855	-8.5°	—	barely soluble in 10 vols.	83.25	5.2	4.5
0.9796	-14.8°	7½ vols.	5½ vols.	93.55	3.97	5.8
0.9778	-12.8°	—	insoluble in 10 vols.	94.29	5.18	4.1
0.9786	-13.5°	—	insoluble in 10 vols.	94.43	4.53	5.4
0.9738	-17.9°	5 vols.	4½ vols.	95.88	5.94	5.6
0.9773	-17.8°	3½ vols.	—	97.89	2.3	4.1
0.9847	-14.7°	insoluble in 10 vols.	5½ vols.	93.02	4.97	12.9
0.9863	-15.0°	insoluble in 10 vols.	6 vols.	94.38	5.92	14.1
0.9770	-15.0°	6½ vols.	5 vols.	95.73	4.9	—
0.9812	-13.0°	insoluble in 10 vols.	7½ vols.	97.02	7.31	—

A large proportion of these oils do not conform to the solubility test of the B. P., while oils distilled previous to 1903 did not present any difficulty with the test for solubility in 70 per cent. alcohol. Experience leads to the opinion: (1) That the present official limits for the optical rotation of the oil are too narrow; (2) that there is no constant correlation between the observed optical activity and the solubility; (3) that the solubility test, even when performed at 20° C., excludes a large number of perfectly genuine specimens of oil; (4) that the proposed limit of "Not below 94 per cent. of santalol by acetylation" is too high; (5) that the physical characters given in the Pharmacopœia are not such as to include the bulk of the genuine oil of East Indian sandalwood distilled in England.—Chem. & Drugg., Sept. 14, 1907, 448.

*Oil of Santal—Adulterated Oils and Proposed Standards for Genuine Oils.*—E. J. Parry and C. T. Bennett record some experiments made with two samples of sandalwood oil which they have reason to consider has been skilfully adulterated with the so-called West Indian sandal oil. These oils were characterized by their low lævogyre rotation, which was -10° and -9°30' respectively, and when fractionated, of the nine fractions obtained the first, ranged from -5°30' to -14°35', and the second from -4°30' to -14°. Similar fractions from four genuine oils ranged from -15° to -21°, -14° to -21°30', -15° to -20°, and -14° to -22°. Obviously a dextrorotatory oil is present in the adulterated samples, which makes the optical rotation of the 10 per cent. fraction very much lower than in the case with normal oils. In the latter the divergence between the fractions is but little, and in no case was the optical rotation lower than -14°. In normal oils, also, the total santalol-content is rarely below 94 per cent., and a minimum of 90 per cent., as required by the U. S. P., may well be adopted. Furthermore, the authors find that when fractions of cedarwood oil are used for adulterating, the resulting oil generally has a higher lævo-rotation than pure sandalwood oil. On the basis of their investigations the authors

suggest the following standards for *Oleum santali* in the next edition of of the B. P.:

Specific gravity.....	0.975 to 0.982
Optical rotation.....	-16° to -20°
Refractive index.....	Not below 1.5030
Santalol (total).....	At least 90 per cent.
Esters as santalyl acetate.....	4 to 6.5 per cent.
Rotation of first and second fractions at 10 per cent.	Not below -16°

It should be soluble in five volumes of 70 per cent. alcohol.

The authors note the fact, however, that pure oils are occasionally met with, which do not comply with the requirements above set out. When old wood is employed for distillation, the oil is sometimes less soluble, and if the distillation has been pushed to the fullest extent, the rotation of the oil may be reduced. It would be very unwise to enlarge the official limits so as to include these oils, as this would open a floodgate to adulteration.—Chem. & Drugg., July 6, 1907, 19-20.

*Oil of Savin—Citronellol a Constituent.*—Schimmel & Co. announce that they have recently detected "citronellol" in a fraction of oil of savin boiling higher than sabinol—this fraction boiling at 78° to 94° C. (4 Mm. pressure) and at ordinary pressure, between 220° and 237° C. The oil was heated on a water-bath with phthalic anhydride for two hours, and from the resulting phthalic acid ester the alcohol was liberated in the usual manner. "Terpineol" could not be detected in a fraction boiling slightly lower.—Schimmel's Rep., Oct., 1907, 89.

*Sumbul Oil—Characters and Constants.*—From fresh slightly dried sumbul roots, Schimmel & Co. obtained by distillation 1.37 per cent. of a rather viscid oil, having an olive-green color, and an odor reminding of angelica oil. The constants were as follows: sp. gr., 0.9410 at 15° C.; opt. rot., + 6° 20'; acid No., 7.0; ester No., 24.4; not completely soluble in 10 vols. 80 per cent. alcohol; soluble in every proportion in 90 per cent. alcohol.—Schimmel's Rep., Oct., 1907, 91.

*Tarragon Oil—Para-Methoxycinnamic Aldehyde a Constituent.*—After distilling off terpenes and methyl-chavicol, an aldehyde was isolated from tarragon oil by Daufresne, which proved to be para-methoxycinnamic aldehyde ( $\text{O.CH}_3\text{-C}_6\text{H}_4\text{-CH-CH-CHO}$ ), b. p., 171° C. It was found to the extent of 4.5 per cent. in an old sample of the oil, but only 0.5 to 0.6 per cent. was found in more recent specimens.—Pharm. Journ., Jan. 4, 1908, 9; from Compt. rend., 145 (1907), 875.

*Tarragon Oil—Constituents.*—An examination of volatile oil of tarragon by A. Daufresne, revealed the presence of the following constituents: *Terpenes*, 15 to 20 per cent., comprising (1) an aliphatic carbide with double bonds, analogous to myrcene and ocimene, and probably identical with the latter; *Estragol*, 60 to 75 per cent., entirely free from anethol;

*Para-methoxycinnamic aldehyde*, 0.5 to 0.6 per cent.; *other substances*, 5 to 20 per cent., probably aldols; they lose water during the process of distillation and resinify.—Pharm. Journ., Mar. 28, 1908, 413; from Bull. des Sci. Pharm., 15, 11.

*Oils of Thyme and Origanum—Commercial Confusion as to Source.*—C. T. Bennett observes that, owing to the great similarity in odor, the terms thyme oil and origanum oil are often used synonymously in commerce, giving rise to some confusion as to the botanical source of the two oils. He gives a brief description of the oils met with in trade, with their proper titles and sources according to the best authorities, and appends the following summary of the characters of thyme and origanum oils:

—	Specific Gravity.	Phenols.	Principal Constituents.	Solubility, 1 vol. in
French thyme oil ( <i>Thymus vulgaris</i> ).	0.905 to 0.920.	18 to 45 per cent.	Thymol, carvacrol, cymene, pinene.	2 vols. 80 per cent. alcohol.
Wild thyme oil ( <i>Thymus serpyllum</i> ).	0.890 to 0.905.	Practically none.	Chiefly cymene.	2 to 3 vols. 80 per cent. alcohol.
Spanish thyme oil (origin doubtful).	0.930 to 0.950.	50 to 70 per cent.	Carvacrol.	3 vols. 70 per cent. alcohol.
Trieste oil ( <i>Origanum hirtum</i> ).	0.940 to 0.980.	60 to 85 per cent.	Carvacrol.	2 to 3 vols. 70 per cent. alcohol.
Smyrna oil ( <i>Origanum smyrnaeum</i> ).	0.915 to 0.945.	25 to 60 per cent.	Carvacrol, linalol, cymene.	2 to 3 vols. 70 per cent. alcohol.
Cyprus oil ( <i>Origanum majoranoides</i> ).	0.961 to 0.967.	78 to 84 per cent.	Carvacrol, cymene, origanene.	2 to 3 vols. 70 per cent. alcohol.
Sicilian oil.	0.920	44 per cent.	Carvacrol.	2 vols. 80 per cent. alcohol.

—Pharm Journ., June 20, 1908, 803.

*French Oil of Thyme—Odorless Crystalline Deposit.*—J. Schindelmeiser obtained from French oil of thyme, after prolonged standing, a crystalline deposit having a faint thyme odor, which disappeared completely after crystallization from hot water, in which it was freely soluble, while in cold water the crystals were sparingly soluble. They were, comparatively, sparingly soluble in alcohol, chloroform, or acetic ether, almost insoluble in ether, and perfectly insoluble in petroleum ether. From alcohol and cold water it crystallized in well-formed, glassy, stout, columnar crystals, melting at 169° C. Its solutions were optically inactive. In its composition it agreed with the formula  $C_{10}H_{18}(OH)_2H_2O$ ; but it does not agree in its general character with any of the terpin hydrates hitherto described. The dark brown oil from which these crystals were obtained contained no

other abnormal constituents that are not usually found in oil of thyme. The author considers it possible that the new compound is identical with the Juniper Camphor (m. p.,  $165^{\circ}$ – $166^{\circ}$  C.,) described in 1895 by Schimmel & Co.—Apoth. Ztg., xxii (1907), No. 79, 853.

*Oil of Thyme—Estimation of Phenol Content by Physical Constants.*—J. Rodié has made experiments with Spanish oils of thyme, in order to ascertain in how far conclusions can be drawn as to their phenol content from the specific gravity and solubility. He has arrived at the conclusion that the phenol content can only be judged approximately by these physical properties, but that in a general way the following conditions apply: Oils having a sp. gr. above 0.950, and which are soluble in 65 per cent. alcohol may be assumed to contain more than 60 per cent. of phenols; if of sp. gr. 0.922 to 0.950, and if they are soluble in 70 per cent. (or, better still, 65 per cent.) alcohol, may be accepted as containing 40 to 60 per cent. of phenols; but oils having a specific gravity below 0.922, especially if they are insoluble in 70 per cent. alcohol, must be regarded as inferior.—Schimmel's Rep., Oct., 1907, 91; from Bull. Soc. Chim., iv, 1 (1907), 236.

*Pure Dithymol—Preparation.*—Cousin and Hérissé recommend the following method which yields from 25 to 30 per cent. of pure dithymol. A solution of 5 Gm. thymol in 50 Cc. alcohol is added to 10 liters of warm water (at  $50^{\circ}$ – $60^{\circ}$  C.), the mixture stirred until solution is effected, allowed to cool, and filtered; then 60 Cc. of solution of ferric chloride (sp. gr. 1.26) is added, and the mixture allowed to stand 3 or 4 days. The precipitate produced is now thoroughly washed with water, then treated with diluted soda solution (10 Gm. liq. sodæ + 200 Gm. water), the alkaline solution is filtered, and precipitated with acetic acid. The crude dithymol so obtained is dissolved in alcohol and allowed to remain in contact with animal charcoal for 10 to 12 hours, whereupon it is again filtered and mixed with an equal volume of boiling water. On cooling, dithymol crystallizes out of the mixture and may then be completely purified by crystallization from 60 per cent. alcohol. The pure dithymol so obtained contains 1 mol. of water of crystallization ( $C_{30}H_{28}O_2 + H_2O$ ); it melts at  $100^{\circ}$ – $101^{\circ}$  C., losing its water of crystallization, and then melting at  $164^{\circ}$ – $165^{\circ}$  C.—Pharm. Ztg., lii (1908), No. 38, 379; from L'Union Pharm., 1908, No. 3.

*Dithymol—Compounds with Chlorine.*—H. Cousin finds that when a current of chlorine is allowed to act on dithymol ( $C_{30}H_{28}O_2$ ), in suspension in chloroform,

*Dichlorodithymol* ( $C_{30}H_{24}Cl_2O_2$ ) is primarily formed. On further action, the halogen acts as a deoxidizer, and removing two atoms of hydrogen from this dichloro compound, forms

*Dichlorodithymoquinone* ( $C_{30}H_{22}Cl_2O_2$ ). Finally, if the action of the



chlorine is continued, this derivative fixes two atoms of chlorine and forms a compound ( $C_{20}H_{22}Cl_4O_2$ ), which must be looked upon as the

*Dichloride of Dichlorodithymoquinone*, since, from its reactions it does not appear to be a tetrachloride of dithymol; for it is insoluble in soda, and can be reduced by  $SO_2$  in alcoholic solution, and by powdered zinc, to dichlorodithymol.—Chem. News, May 15, 1908, 239; from Compt. rend., 146 (1908), No. 12.

*Oil of Vitex Agnus Castus—Characters and Constituents.*—Schimmel & Co., having received from Asia Minor a parcel of leaves of *Vitex agnus castus*, from time immemorial valued in the Orient as a medicinal and wonder plant, have distilled from them the volatile oil. The yield was 0.48 per cent.; it was of a brown color, had a not unpleasant, hyssop-like odor, and gave the following constants:  $d_{15^\circ}$ , 0.9010;  $a_D$ ,  $-7^\circ 55'$ ; acid No., 6.4; ester No., 18.3; ester No. after acetylation, 58.4; soluble in 0.4 and more 90 per cent. alcohol. Of constituents, cineol was detected with certainty; it appears also to contain some sabinene and a quinone.—Schimmel's Rep., 1908, 121.

#### ALCOHOLS AND DERIVATIVES.

*Alcohol—New Percentage Tables.*—Since the publication of an elaborate alcohol table by Dr. Edward W. Mosley (Journ. Am. Chem. Soc., Oct., 1904), based upon the exhaustive researches of Mendeléeff on the density at different temperatures of mixtures of alcohol and water, A. B. Lyons has had it in mind to deduce from Mosley's figures a new table for practical use. Mosley's tables give the true specific gravity for each integral percentage by weight from 0 to 100 per cent., for each degree of the centigrade hydrogen thermometer from  $15^\circ$  to  $22^\circ$  C.; but such a table is not at all adapted to the needs of the practical pharmacist. The new interest in alcoholometry resulting from recent legislation has supplied an incentive and Dr. Lyons has now, after laborious calculations, constructed three new tables which enable the pharmacist to determine the correct volume percentages corresponding to the given specific gravities at certain temperatures. Table I gives the apparent specific gravity of alcohol of various strengths ( $a$ ) at  $15.56^\circ$  C., ( $60^\circ$  F.), and ( $b$ ) at  $25^\circ$  C., ( $77^\circ$  F.) Table II contains the data for quite exact determinations of alcohol percentages by specific gravities taken with pycnometer, Westphal balance or "spindle" at ordinary room temperatures. Table III is intended for ordinary use where results of great exactness are not required. These several tables may be consulted in Pharm. Rev., Dec., 1907, 353–361.

*Recovered Alcohol—Table for its Convenient Conversion into Menstrua of Required Strength.*—To prepare from recovered alcohol, which of course varies greatly in strength, a spirit of a certain definite percentage calls for a rather troublesome mathematical calculation. The difficulty is

that when alcohol and water are mixed, condensation of volume takes place. It is convenient, therefore, to make the necessary calculations once for all, and this has been done by Dr. A. B. Lyons, who has constructed from the results of careful calculation a table by reference to which any individual problem may at once be solved. The table gives only the volumes of official alcohol required to make 100 volumes of a desired mixture, measured after cooling, but includes nearly all menstrua likely to be required. It is impracticable, of course, to reproduce this compendious table in this report, and it must therefore be consulted in the original. In fact, a reprint of this elaborate table, mounted on cardboard, would prove exceedingly convenient for consultation in the pharmacists' daily laboratory work, if the author can see his way clear to have it published in this desirable shape.—Pharm. Rev., June, 1908, 161-166.

*Alcohol—Dehydration with Lime.*—Anton Kailan has studied the question of the dehydration of alcohol by prolonged heating with lime under a reflux condenser in place of repeated distillation. It is found that by using 0.55 kilo of lime per liter, 92.93 per cent. alcohol may be converted into either 99.5 per cent. or 99.9 per cent. by heating for three and a half or six hours respectively. If a larger quantity of lime be used the dehydration may be effected more rapidly, but the amount of alcohol retained by the lime is much greater.—Pharm. Journ., Febr. 8, 1908, 151; from Monatsh. f. Chem., 28 (1907), 927, through Chem. Centralbl., 1907, 2, 1489.

*Alcohol—Estimation in Galenical Preparations.*—Professor Wilbur L. Scoville contributes a valuable essay on the estimation of alcohol in galenical preparations. It is impracticable to condense this paper, but pharmacists will find it very interesting and will doubtless consult it with much profit, since the author has a wide experience in practical laboratory operations, and particularly those connected with the preparation of galenicals.—Drugg. Circ., Jan., 1908, 6-7.

*Alcohol and Ether—Rapid Estimation in their Admixtures.*—J. Fleischer and H. Frank take advantage of their observation that, while ether-alcohol is soluble by itself in benzin as well as in water, its two components are volumetrically separated if the two solvents are added at the same time; the ether enters into solution with the benzin while the alcohol is taken up by the water, the two solutions forming distinctly separate layers. The increase in the volume of benzin denotes the volume of ether present in the ether-alcohol, that in the aqueous layer the volume of alcohol. Thus, for example, 10 Cc. of a mixture of ether and alcohol are mixed in a graduated cylinder with 5 Cc. of benzin and 5 Cc. of water. After standing a few minutes two sharply defined layers are formed, the upper measuring 12 Cc., the lower 8 Cc. This gives directly the relative proportions of ether and alcohol, viz., 7:3 in the mixture, assuming that it was anhydrous originally. If, however, the ether-alcohol

mixture contains water, the specific gravity of the mixture must first be ascertained. The volume of ether being then determined, the volume of hydrous alcohol (or alcohol and water) may be determined according to the following formula:  $d = \frac{10d' - a/0.729}{10 - a}$ , in which  $d$  signifies the sp. gr.

of the hydrous alcohol,  $d'$  the sp. gr. of the ether-alcohol mixture under examination,  $a$  the cubic centimeters of ether, previously determined, and 0.729 the sp. gr. of the ether. The figures thus obtained enable the determination of strength of the alcohol according to Tralles' scale.—Pharm. Ztg., lii (1907), No. 55, 573; from Chem. Ztg., 1907, No. 53.

*Ethyl Chloride—Prolonged Anæsthesia by a Mixture with Oxygen.*—

A number of experiments on animals made by Rosenthal and Albert Berthelot have shown that with a mixture of oxygen and ethyl chloride, instead of ethyl chloride only, it is possible to obtain a prolonged anæsthesia without any untoward results. The narcosis is tranquil, and the waking prompt. It is hoped that the mixture may be of use on the human subject. It has the advantage in operations of long duration of having none of the drawbacks found in the case of ether and chloroform.—Pharm. Journ., March 7, 1908, 819; Compt. rend.; through Rép. de Pharm., Febr, 10, 1908, 77.

*Ethylene and Ethene Chlorides—Useful Solvents for Extractions.*—The industrial production of a number of ethylene and ethene chlorides supplies a series of indifferent and stable volatile solvents and extraction fluids, which, having among themselves a wide range of boiling points, adapt themselves to the most varied requirements of extraction—temperature and volatility. These solvents, which are all non-inflammable and non-explosive, are the following:

*Dichlorethylene*,  $C_2H_2Cl_2$ ; b. p.,  $55^\circ C.$ ; sp. gr., 1.25.

*Trichlorethylene*,  $C_2HCl_3$ ; b. p.,  $88^\circ C.$ ; sp. gr., 1.47.

*Perchlorethylene*,  $C_2Cl_4$ ; b. p.,  $121^\circ C.$ ; sp. gr., 1.62.

*Tetrachlorethene*,  $C_2H_2Cl_4$ ; b. p.,  $147^\circ C.$ ; sp. gr., 1.60.

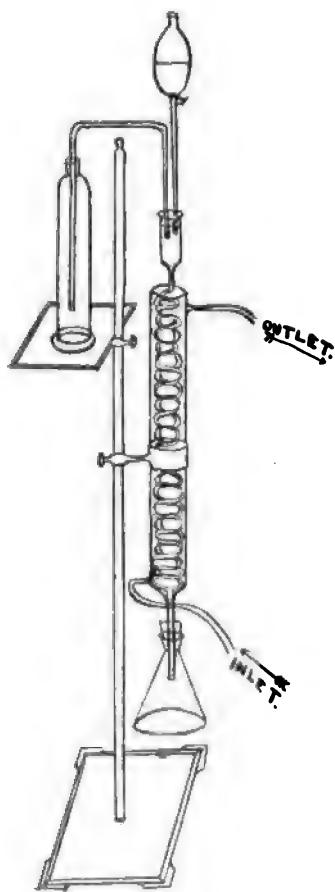
*Pentachlorethene*,  $C_2HCl_5$ ; b. p.,  $159^\circ C.$ ; sp. gr., 1.70.

The three ethylene derivatives—dichlorethylene, trichlorethylene and perchlorethylene—have no effect upon, and are not affected by, iron, copper, lead or zinc, even in the presence of water; nor by acids or alkalis, even in presence of the metals named. Trichlorethylene, in particular, which has nearly the same boiling-point as benzin, and is not much more expensive than tetrachloride of carbon, appears to be well adapted for extraction processes; while the solvent action of dichlorethylene and perchlorethylene is very nearly as good as that of trichlorethylene—dichlorethylene probably efficiently replacing ether in shaking-out processes. Tetrachlorethene exhibits pronounced solvent action on fats, oils and resins, and is further characterized by possessing a solvent

power on sulphur greater than that of all known solvents. Pentachloroethene possesses solvent properties very similar to those of tetrachloroethene.—*Pharm. Ztg.*, lii (1907), No. 90, 941; from *Chem. Ztg.*, 1907, No. 88.

*Concentrated Nitrous Ether—Estimation of Alcohol Content.*—W. A. Pearson finds that a modification of the method of Dupré (*Allen*, Vol. I, 102) for estimating alcohol in concentrated nitrous ether gives very satisfactory results if exceptional care is taken at every step, as outlined in his paper.

FIG. 71.



Apparatus for Estimating Alcohol.

The method depends on the volatilization of the ether at the ordinary temperature and causing the gaseous ether to bubble through ice water, which retains the alcohol, and in which the alcohol, having been oxidized with chromic acid, is finally estimated as acetic acid by titration. Aldehydes, if they be present, will be estimated along with alcohol, and some of the methods for estimating aldehydes must be used for this correction. Any ethyl nitrite left dissolved in the water along with the alcohol is also changed into acetic acid, but the error from this source is so slight that it may, in most cases, be ignored. The author describes several apparatus which he has devised for this process of estimating alcohol, the one shown by Fig. 71 serving well to explain the method. The Erlenmeyer flask, containing the ether, is connected with an upright spiral condenser, and ice water is poured in through the top. If the lower opening of the condenser is quite small, a spiral column of ice water will be held in the condenser by the pressure developed by the volatilization of the concentrated nitrous ether, and this will necessitate each bubble of gas to pass through this spiral column of cold water, thus washing the gas and freeing it from alcohol. At

least three days should be allowed for the complete evaporation of the concentrated ether. Another form of apparatus, not reproduced here, shows the spiral condenser arranged horizontally, each bend of the spiral containing ice water up to a certain height. A simple method consists in

causing the gas to bubble through a series of five tall wash-bottles three-fourths filled with ice water. This has the further advantage that the temperature conditions can be carefully controlled.—*Amer. Journ. Pharm.*, Mar., 1908, 101-105.

*Chloroform—Ethyl Chloride in the Product from Alcohol.*—D. B. Dott observes that books give three different equations for the formation of chloroform from alcohol—one in which two molecules of alcohol yield two of chloroform, one in which four of alcohol yield two of chloroform, and one in which three of alcohol yield two of chloroform. The last most correctly agrees with experimental results. Some years before the publication of Finnemore and Wade's paper on chloroform the author satisfied himself that ethyl chloride was present in the first fraction obtained in rectifying chloroform in large quantity. The small yield of chlorine when the liquid was decomposed by alcoholic potash suggested the presence of ethyl chloride, as most possible compounds would be removed by the washing with water or sulphuric acid. On making a mixture of chloroform with the calculated proportion of ethyl chloride, it coincided in sp. gr., boiling-point and other properties with the light fraction referred to. Though not absolute proof, it was very near it. The author also points out the probable existence of a

*Compound of Chloroform and Acetone*, which has not been previously noted. He has observed that when acetone and chloroform are mixed there is a considerable rise of temperature—nearly  $12^{\circ}$  C. being observed by mixing in proportion of two molecules of chloroform to one of acetone. This mixture distils rather higher than either of the constituents, which fact indicates that it is probably a compound.—*Chem. & Drugg.*, Febr. 22, 1908, 299.

*Iodoform Sulphur—A definite Chemical Compound.*—According to V. Auger, a definite compound of sulphur and iodoform ( $\text{CHI}_3 \cdot 3\text{S}_8$ ) has been formed in the following way: Iodoform and sulphur are dissolved, each separately, in the smallest possible quantity of carbon bisulphide by the aid of heat, using preferably a slight excess of sulphur, and mixing the two solutions. On cooling the solution a crop of magnificent pale yellow crystals of the compound is obtained. It melts at  $93^{\circ}$  C., is stable in air, but becomes red in color on exposure to light. Analysis shows that iodine is present to the extent of 32.25 per cent., and sulphur, 66.20 per cent., figures which agree very closely with the theoretical. Compounds of sulphur and mineral iodides, *e. g.*, arsenium triiodide, antimony triiodide, etc., have been formed under similar conditions.—*Pharm. Journ.*, May 2, 1908, 572; from *Compt. rend.*, Mar. 2, 1908, 477.

*Chloral Hydrate—Assay.*—The B. P. process for the assay of chloral hydrate, which depends upon the decomposition of the chloral with sodium hydroxide in excess and determination of the excess of alkali by

titration with sulphuric acid, is well known to be inaccurate, and modifications have consequently been proposed by Henrich and by Wallis. The latter proposed the estimation on the basis of the chloride contained in the solution after neutralizing the alkaline product of the reaction (obtained under certain provisions) with sulphuric acid, and this modification has been found by P. A. W. Self to be reliable, but unnecessarily long and tedious, and not without an element of danger. Taking advantage of the statement in Wall's "Dictionary of Chemistry" (vol. ii, p. 4), that chloral hydrate, when boiled with zinc dust, is entirely decomposed with formation of zinc chloride and oxychloride, Self now has made a series of experiments which determine that not only zinc dust but also aluminum powder, are available for the assay of chloral hydrate, and afford a method that is at least as accurate as the method of Wallis (heating with alcoholic sodium hydroxide, etc.), and at the same time more convenient. The proposed method, which may be both gravimetric and volumetric, is conducted as follows:

Boil about 0.3 Gm. of chloral hydrate with 1 Gm. of aluminum powder (or 2.5 Gm. of zinc filings—about No. 20 powder), 15 Cc. of acetic acid (B. P.), and 40 Cc. of water, under a reflux condenser for half an hour. Then filter, wash the filter and flask with water, precipitate the chloride as  $\text{AgCl}$ , dry and weigh. If it is desired to use a volumetric method of determining the chloride produced by either of the above methods, the following modification may be adopted:

Take 0.25 Gm. of chloral hydrate, treat in the manner given above, and finally, instead of precipitating the chloride in the filtrate as  $\text{AgCl}$ , add 50 Cc. of  $\frac{N}{10}$   $\text{AgNO}_3$ , filter out the silver chloride, and titrate the excess of silver nitrate with  $\frac{N}{10}$  ammonium sulphocyanate, adding 10 Cc. of strong nitric acid, and 5 Cc. of a saturated solution of iron alum to serve as indicator. Each Cc. of  $\frac{N}{10}$   $\text{AgNO}_3$  used is equivalent to 0.005472 Gm. of  $\text{CCl}_3\text{CH}(\text{OH})_2$ . This method gives perfectly satisfactory results, as shown in a number of examples given in form of a table—the gravimetric method showing 99.74 per cent., the volumetric 99.65 per cent.—Pharm. Journ., July 6, 1907, 4-7.

*Chloral Hydrate—Quantitative Determination.*—In common with other experiments, J. Garnier finds the method commonly employed for the quantitative determination of chloral hydrate (decomposition with caustic alkali and titration of excess employed) liable to yield uncertain results. His experiments lead him to propose the following manipulation as the most simple and reliable: 0.1655 Gm. of chloral hydrate is dissolved in 10 Cc., and 12.5 Cc.  $\frac{N}{10}$  potassium hydroxide solution is added. After standing 15-20 minutes at a temperature not exceeding  $15^\circ \text{C}$ ., the mixture is titrated with  $\frac{N}{10}$  sulphuric acid, using phenolphthalein as indicator. To be certain, it is advisable to make a second experiment under identical conditions; an expedient which is absolutely demanded if the concentra-

tion of the solution is unknown.—Pharm. Ztg., liii (1908), No. 28, 278 : from Bull. des sc. pharm., 1908, No. 2.

*Hydrated Chloral—Action of Magnesium Hydroxide.*—L. Rosenthaler and R. Reis, in view of the statements in the literature that chloroform is not decomposed by calcined magnesia (and water) when treated with it for half an hour, whilst chloral is decomposed into chloroform and formic acid when treated in the same way, have made some experiments with the object of establishing, if possible, a method for the quantitative determination of hydrated chloral. The results show, however, that although chloroform is not decomposed during the reaction, the amount of magnesium hydroxide consumed is not in the molecular proportion, required for the splitting-up of hydrated chloral into chloroform and formic acid, but that it is in excess of the quantity needed. The authors attribute this to subsidiary reactions attending the main reaction involved in the process.—Apoth. Ztg., xxii (1907), No. 65, 678.

*Chloral Hydrate—Utility of its Solution as a Solvent in Chemical and Microscopical Work.*—The solvent power of chloral hydrate solution upon the greatest variety of substances has been mentioned heretofore in these reports, and very exhaustively in the report of 1902 (see Proceedings, 1902, 997). Prof. E. Schaer, who has recommended and employed it extensively during recent years in chemical, microchemical and microscopic work, now reviews the extensive field of the utility of chloral hydrate solutions in these directions, and draws particular attention to the facility with which even such substances as resins, gum resins, volatile and fixed oils, waxes and different coloring matters can be separated and identified by the aid of chloral solutions of high percentage. In microscopic operations, both aqueous and alcoholic solutions serve admirably by their intensely effective penetration and powerful solvent action on a variety of substances, and particularly in cases in which it is desirable to remove chlorophyll, starch, coloring matter, tannoid substances, fats, resins, waxes and the like from their associations. Moreover, these solutions possess the advantage over other clearing agents in that they manifest little or no destructive action upon the tissues.—Pharm. Ztg., lii (1907), No. 98, 1020 ; from Ber. d. D. Pharm. Ges., 1907, No. 8.

*Chloral Menthols—Definite Compounds.*—According to Monteil chloral forms two definite compounds with menthol, namely, chloral-monomenthol and chloral-dimenthol.

*Chloral Monomenthol* is obtained by heating chloral hydrate, 147.5, with menthol, 156, on the water-bath at 100° C. It is an oily liquid, insoluble in water, and devoid of the caustic action of its constituents. With molecular proportions of camphor, analgesine, salol, benzoic acid, salicylic acid and boric acid, it affords definite compounds, all of which have therapeutic possibilities.

*Cloral-Dimethol*, which possesses similar properties, is prepared in a like manner with chloral hydrate, 147.5; menthol, 312. The oily liquid is turbid at first, but becomes limpid when dried with fused calcium chloride. Chloral dimethol does not itself solidify when cooled, but its compounds with organic bodies become more or less solid on cooling. These are analogous to the compounds obtained with chloral monomethol.—Pharm. Journ., April 25, 1908, 548; from L'Union, 49, (1908), 56.

*Formaldehyde—Polymeric Modifications.*—Fr. Auerbach and H. Barschall have prepared and describe six different polymeric modifications of formaldehyde, these consisting, besides of the well-known paraformaldehyde, of the following "polyoxymethylenes":

$\alpha$ -*Polyoxymethylene*, which is precipitated from pure aqueous solutions of formaldehyde by the addition of  $\frac{1}{10}$  volume of sulphuric acid. It is indistinctly crystalline and melts at  $163^{\circ}$ – $168^{\circ}$  C.

$\beta$ -*Polyoxymethylene* is obtained in the same way on addition of  $\frac{4}{10}$  volume of sulphuric acid, and has the same melting-point ( $163^{\circ}$ – $168^{\circ}$  C.), but is distinctly crystalline.

$\gamma$ -*Polyoxymethylene* is obtained from the methyl-alcohol solution of formaldehyde on addition of  $\frac{4}{10}$  volume of sulphuric acid, being precipitated along with the  $\beta$ -polymeride, from which it is separated by extraction with sodium sulphite. It is crystalline, and melts at  $163^{\circ}$ – $165^{\circ}$  C.

$\delta$ -*Polyoxymethylene* is obtained by prolonged boiling of the  $\gamma$ -polymeride with water. It is indistinctly crystalline, and melts at  $169^{\circ}$ – $170^{\circ}$  C. The sixth polymeride,

$\alpha$ -*Trioxymethylene* ( $C_3H_6O_3$ ), is obtained by subliming polyoxymethylene, collecting the vapor in water, treating the solution with sodium sulphate for the fixation of unchanged formaldehyde, and extracting the trioxymethylene formed with ether. While the aqueous solution of paraformaldehyde and the polyoxymethylenes are not distinguishable from formaldehyde solutions,  $\alpha$ -trioxymethylene, both in its gaseous form and in aqueous solutions manifests marked distinction from formaldehyde. It is a stable, crystalline body, melting at  $63^{\circ}$ – $65^{\circ}$  C. and probably has a ring-formed constitution.—Pharm. Ztg., lii (1907), No. 81, 851; from Arb. aus. d. Kais. Ges.-Amt., 1907, 27, No. 1.

*Formaldehyde—Production by the Action of Magnesium on Carbon Dioxide and Formic Acid.*—H. Fenton has observed that by the action of metallic magnesium upon aqueous solutions of carbon dioxide, under certain conditions, determinable quantities of formaldehyde are produced, these quantities being considerably augmented in the presence of ammonia, aniline, phenylhydrazine, or aluminum hydroxide. Furthermore, that formic acid may also be reduced to formaldehyde under the influence of magnesium, from which it follows that the reduction of carbon dioxide



may be carried out in two steps, with formic acid as intermediary product. Regarding the known

*Methods for the Detection of Formaldehyde*, the author regards\* the following three to be the most pronounced: 1. With phenylhydrazine chloride, sodium nitroprusside and sodium hydroxide solution, a transient blue color. 2. With alcoholic solution of gallic acid and concentrated sulphuric acid, development of a blue zone. 3. With resorcin solution and concentrated sulphuric acid, development of a red or red-violet zone.—Pharm. Ztg., lii (1907), No. 72, 748; from Proc. Chem. Soc., 23 (1907), 83-84.

*Formaldehyde—Carbazole a New Reagent*.—Carbazole ( $C_{12}H_9NH$ ) dissolves in concentrated sulphuric acid to a yellow solution, which on carefully warming becomes colorless and then reddish-violet. Emilio Gabutti finds, however, that in the presence of mere traces of formaldehyde (1:10000) a blue color is formed, and if the amount of formaldehyde is considerable a bluish-green precipitate may even be produced. Acetic aldehyde under the same conditions gives a yellow or reddish-yellow color. The reaction may also be employed for detecting formaldehyde in milk, in which case a few drops of the milk should be added to a solution of carbazole in an excess of concentrated sulphuric acid; in the absence of formaldehyde a reddish color will develop instead of a blue. The reaction is more delicate if performed on the distillate obtained by blowing a current of steam through the previously neutralized milk.—Pharm. Journ., Aug. 3, 1907, 185; from Boll. Chim. Farm., 46 (1907), 349.

*Formaldehyde Solutions—Influence of Light and Heat not Very Pronounced*.—Experiments made by J. W. de Waal, with the particular object of ascertaining to what extent exposure of formaldehyde to light and heat is concerned in its polymerization and in its conversion into formic acid, lead to the conclusion that under the influence of daylight the conversion into formic acid is so slight as to be almost negligible. Its influence is accelerated, however, very decidedly if minute quantities of ferric chloride are present, and to a still higher degree under the simultaneous action of heat. Heat, alone, promotes the formation of acid, but here also only if it is prolonged and sufficiently intense ( $50^{\circ}C.$ ) The author concludes that, although exclusion of direct light and heat will protect formaldehyde from conversion into formic acid, the protection from light required by most pharmacopœias is not absolutely essential.—Pharm. Ztg., lii (1907), No. 89, 933; from Pharm. Weekbl., 1907, No. 40.

*Glycerin—Solvent Properties on Salts, etc.*—Ossendowski has determined the solubility of a number of salts, etc., in glycerin prepared from a seed-oil, and of exceptional purity. 100 parts by weight of this glycerin dissolved at  $15^{\circ}-16^{\circ}C.$ , the following quantities of the substances named:

Ammonium carbonate.....	20.00	Potassium chlorate.....	3.54
Ammonium chloride.....	20.06	Potassium chloride .....	3.72
Barium chloride.....	9.73	Potassium cynaide .....	31.84
Benzoic acid.....	10.21	Potassium iodide.....	39.72
Borax .....	60.00	Quinine .....	0.47
Boric acid.....	11.0	Sodium arsenate .....	50.0
Calcium sulphate.....	5.17	Sodium bicarbonate .....	8.06
Copper acetate.....	10.0	Sodium carbonate.....	98.3
Copper sulphate.....	36.30	Sulphur .....	0.14
Iodine .....	2.0	Tannin .....	48.83
Mercuric chloride.....	8.00	Zinc chloride.....	49.87
Oxalic acid.....	15.10	Zinc iodide.....	39.73
Phosphorus.....	0.25	Zinc sulphate.....	35.18
Potassium arsenate .....	50.13		

—Pharm. Journ., Nov. 2, 1907, 575; from Journ. de la Soc. Phys. Chem. Russe.

*Glycerin vs. Sugar.*—The relative advantages of these in syrups and other preparations are discussed in a paper by William C. Kirchgessner, in the "Proceedings" of this Association, 1907, 159–161.

*Nitroglycerin—Modern Improvements in Manufacture.*—After a brief historical review of nitroglycerin and particularly its introduction and use as an explosive for blasting purposes, etc., Lieut.-Col. Sir Frederic L. Nathan, R. A., and William Rintoul describe the development in its industrial production, which appears to have eliminated some of the danger in its manufacture and, at the same time, to have increased the output from a given quantity of material. Thus, the plant erected at the Royal Gunpowder Factory in 1903 differs in some essential particulars from the plants previously used. Instead of running by gravity the mixture of nitroglycerin and waste acid on the completion of nitration into a separating tank below the nitrating vessel, allowing the separation of the nitroglycerin from the waste acid to take place in this tank, and then running the nitroglycerin again by gravity into a washing tank, the separation is allowed to take place in the nitrator itself, and as the nitroglycerin separates out it is displaced by waste acid admitted at the bottom of the nitrator, down a gutter attached to the top of the nitrator into the pre-wash tank, placed so that its top is very slightly lower than the top of the nitrator. This arrangement much simplifies the plant and obviates the dangers incidental to the use of earthenware cocks. Advantage is taken of the fact that the addition of a small percentage of water to the waste acid after the nitroglycerin has separated out, prevents the formation of further small quantities of nitroglycerin on allowing the waste acid to stand, to do away with the tedious and expensive operation known as "after separating." A further improvement, now very general in all modern plants, is the substitution of rubber pipes for earthenware cocks for running off nitroglycerin. The early yield of nitroglycerin varied around

200 per cent. ; in more modern methods yields averaged 210 per cent., an average yield of 214 per cent. has been obtained at the Royal Gunpowder Factory during the past 8 years, and it is confidently believed that a yield of 230 per cent. will eventually be obtainable.—Chem. News, Feb. 14, 1908, 74-75.

*Nitroglycerin—Importance of Assay in Preparations.*—L. Henry Bernegau draws attention to the importance of establishing the strength of finished preparations of nitroglycerin. Spirits of glonoin, sold to contain 10 per cent., have been found to contain only 8.5 per cent. by weight of nitroglycerin ; and since these again are used for making the various preparations of nitroglycerin, the latter must vary in accordance. Tablets made with nitroglycerin lose 30 to 40 per cent. in strength during manufacture, but age does not seem to have much effect on them. For the determinations of nitroglycerin in solutions as well as in tablets, Lunge's Nitrometer gives the best results, but its use requires a little experience.—Amer. Journ. Pharm., Dec., 1907, 555.

*Acid Glycerophosphates — Preparation and Advantages.* — In consequence of the pharmaceutical importance which the glycerophosphates have recently assumed, P. A. W. Self gives a brief outline of the general properties and methods of preparation of the "acid" glycerophosphates, which possess the advantages of greater solubility, and at least the same stability as the "neutral" glycerophosphates. The general methods of preparation are as follows :

(1) The acid glycerophosphates of barium, strontium, and calcium, are prepared by the addition of sulphuric acid to a solution of the corresponding glycerophosphate, until this solution reacts acid to methyl-orange.

(2) The remaining acid glycerophosphates may be prepared by double decomposition between one of the acid salts mentioned above—preferably that of barium—and the soluble sulphate of the metal whose acid glycerophosphate is required.

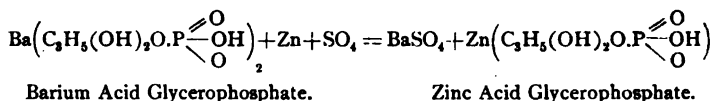
The general properties of the acid glycerophosphates may be summarized as follows :

They are very soluble in water—much more so than the neutral salts—and are precipitated with difficulty from their aqueous solutions by alcohol, the precipitates thus obtained being transparent and gelatinous. They are not crystalline, and when dried *in vacuo* form white (or blue in the case of copper) vitreous and hygroscopic masses. The aqueous solutions are less easily precipitated by heat than those of the neutral salts, but when boiled slowly decompose.—Pharm. Journ., May 16, 1908, 627-628.

*Barium Acid Glycerophosphate—Details of Preparation.*—P. A. W. Self gives the following details of the preparation of barium acid glycerophosphate, which serves as a type for the preparation of the corresponding

strontium and calcium salts: Make a 1.5 per cent. solution of neutral barium glycerophosphate in water, and to it add sulphuric acid until the liquid is very slightly acid to methyl orange. Then add a little freshly precipitated aluminum hydroxide, and boil for five or ten minutes, in order to completely precipitate the barium sulphate. Filter, precipitate the filtrate with about four times its volume of 95 per cent. alcohol, redissolve the gelatinous precipitate in a little water, again precipitate with alcohol, and finally dry at 120° C. So obtained, barium acid glycerophosphate is a white, amorphous and anhydrous mass, soluble in water in proportion of 4:10. The strontium and calcium salts have similar characters.

*Zinc Acid Glycerophosphate* is prepared as follows: First prepare a 3 per cent. solution of barium glycerophosphate in water, and add the requisite quantity of sulphuric acid as directed under the barium salt. Next add at once, previously dissolved in a little water nine-tenths of the theoretical quantity of zinc sulphate required by the equation:



and then the remainder of the zinc sulphate very gradually, until after boiling and filtering, the liquid begins to precipitate barium chloride solution. Finally add aluminum hydroxide and finish as in the case of the barium salt. The magnesium, copper, sodium and potassium salts may be prepared in exactly the same manner as zinc acid glycerophosphate. The first two are rendered anhydrous when dried at 120° C., but the sodium and potassium salts contain water, which cannot be expelled without at the same time decomposing them.—Ibid., p. 627.

*Glycerophosphates of Mercury—Preparation and Composition.*—G. Prunier has obtained both the mercurous and mercuric salts of glycerophosphoric acid by double decomposition of solutions of mercurous or mercuric nitrate respectively, containing free nitric acid, with 30 per cent. solution of sodium glycerophosphate. Neither of these salts have heretofore been known.

*Mercuric Glycerophosphate* contains 54.29 per cent. of mercury and 8.21 per cent. of phosphorus.

*Mercurous Glycerophosphate*, 70.07 per cent. of mercury and 5.40 per cent. of phosphorus.—Pharm. Ztg., liii (1908), No. 11, 110; from Bull. Commenc., 1907, No. 11.

*Phenols—Diphenylurea Chloride as a Reagent.*—Diphenylurea chloride combines with a number of phenols, forming easily crystallized and characteristic phenylurethanes. J. Herzog utilizes this property for the identi-

fication of phenols. The phenolic body is heated for an hour on the water-bath, under a reflux condenser, with four molecular weights of pyridine and one molecular weight of diphenylurea chloride. The solution is then poured into water with thorough agitation. A red crystalline magma is thus formed; the aqueous liquid is decanted, and the mass is dried, and purified by recrystallization from petroleum and ether, or with phenols of high molecular weight, from alcohol. The phenoldiphenylurethanes thus obtained from different phenols have the following melting points: Phenoldiphenylurethane,  $104^{\circ}$ – $105^{\circ}$  C.; resorcin diphenylurethane,  $129^{\circ}$ – $130^{\circ}$  C.; orthocresol diphenylurethane,  $72^{\circ}$ – $73^{\circ}$  C.; meta-cresol diphenylurethane,  $100^{\circ}$ – $101^{\circ}$  C.; paracresol diphenylurethane,  $93^{\circ}$ – $94^{\circ}$  C.; eugenol diphenylurethane,  $107^{\circ}$ – $108^{\circ}$  C.; salol diphenylurethane,  $143^{\circ}$ – $144^{\circ}$  C. These bodies are readily saponified, regenerating the respective phenols. As the yield is excellent, as small a quantity as 0.1 Gm. of the phenol may suffice for its identification by this method.—Pharm. Journ., Aug. 31, 1907, 315; from Journ. d. Pharm. et Chim., 26 (1907), 83.

*Phenol—Action of Sulphuric Acid.*—J. Obermiller has made a comprehensive study of the action of sulphuric acid on phenol. He finds that the difficulty experienced by Kekulé and others in separating *o*- from *p*-phenol sulphonic acid is overcome by making use of the different solubilities of their mono-barium salts ( $-\text{SO}_3\text{H}$  salts). On crystallizing a mixture of the two salts the author finds, in opposition to Kekulé, that the salt of the ortho acid crystallizes out first; if the mother liquors are then treated with magnesium sulphate and further concentrated, the well-crystallized monomagnesium salt of the para acid is obtained. The two acids may, however, also be separated by means of their magnesium salts alone. For this purpose the crude sulphonation mixture is converted into the monomagnesium salt, when, on evaporation, the major portion of the para salt separates out; the mother liquors are then treated, while hot, with magnesia so long as any more dissolves, and on further concentration only the di-magnesium salt (OH salt) of the ortho acid crystallizes out. If the final mother liquors obtained from either of these two methods of separation are then boiled with barium hydroxide, the OH barium salts of both the ortho and the para acid are precipitated almost completely, together with the barium salt of the 2:4 di-sulphonic acid, which is very readily formed during the sulphonation. The solution, however, still contains a very soluble OH barium salt, which would appear to be a mixture containing, possibly, some of the meta-sulphonic acid. The author has been able to confirm Kekulé's observation that the formation of ortho acid is favored by carrying out the sulphonation at a low temperature with as dilute sulphuric acid as possible, but he has not been able to obtain such large yields as Kekulé. He refutes this author's statement that the ortho acid may be completely converted into the para acid by prolonged heating in

aqueous solution over a water-bath. The paper contains a minute account of the preparation and properties of the various potassium, sodium, barium, strontium, calcium, magnesium, lead and aluminum salts of the ortho and para phenol mono-sulphonic acids, as well as of the 2 : 4 di-sulphonic acid. An account of the color reactions of these acids with ferric chloride is also given.—Pharm. Journ., Dec. 21, 1907, 817; from Ber. d. D. Ch. Ges., 40 (1907), 3623-3647.

*Phenol and Cresols—Biological Determination.*—By the aid of fresh cultures of *Bacterium coli*, Blyth and Goodban have successfully carried out the determination of phenol and cresols by a biological method, which is described in Chem. Centr.-Bl., 1908, i, No. 7.—Pharm. Ztg., liii (1908), No. 20, 200.

*Creosot Carbonate—Artificial Decoloration.*—Dr. Aufrecht shows experimentally that creosotal, which is colorless, has been made so by the addition of complimentary coloring substances, whereby the natural *yellowish tint* of the preparation is neutralized.—Pharm. Ztg., liii (1908), No. 48, 480.

*Guaiacol—Preparation of Phosphoric Acid Ethers.*—V. Auger and P. Dupuis have obtained acid phosphates of guaiacol, containing one or two molecules of guaiacol to one molecule of  $H_3PO_4$  by three methods: 1. By boiling phosphorus oxychloride with guaiacol; according to the conditions of the reaction the product obtained is the dichloride of guaiacol phosphoryl, the chloride of diguaiacol phosphoryl, or the neutral phosphate of guaiacol. The hydrolysis of the chlorides gives the corresponding acids. 2. By allowing phosphorus oxychloride to react on a mixture of guaiacol and pyridine in the cold. The salt of pyridine obtained when decomposed by an alkali gives salts of the ether acids formed. 3. By saponifying with alcoholic soda the neutral phosphate of guaiacol.—Chem. News, June 26, 1908, 310; from Compt. rend., 146 (1908), No. 22.

*Resorcinol—Incompatibility with Liquid Petrolatum.*—L. L. Walton calls attention to the insolubility of resorcinol in liquid petrolatum. It had been prescribed in a spray-solution, for which 3 grains each of menthol and eucalyptol, 2 grains of resorcinol, and  $\frac{1}{2}$  fl. oz. of liquid petrolatum had been directed, in the expectation that a clear solution would be formed. A turbid mixture, unsuitable for spraying, resulted.—Proc. Pa. Pharm. Assoc., 1907, 111.

*Resorcinol—Melting-Point.*—C. T. Bennett, considering the range of  $110^\circ$  to  $119^\circ$  C., given as the melting-point of resorcinol in various textbooks too wide, has examined a large number of samples from various sources during the last few years, and found that all of them melted between  $110^\circ$  and  $111^\circ$  C. A sample which he had repeatedly crystallized from benzol, yielded in no instance a product melting higher than  $110^\circ$  C., and he believes this to be the true melting-point. The Germ. P. gives

the melting-point at  $110^{\circ}$  to  $111^{\circ}$  C.; the U. S. P. gives it at  $119^{\circ}$  C., and this appears to have been adopted in the B. P. C. The above-mentioned crystallized samples assayed 100 per cent. by the process suggested by Richard, which depends on the formation of tri-iodo-resorcinol in the presence of sodium acetate.—Pharm. Journ., June 6, 1908, 758.

#### FIXED OILS.

*Fixed Oils—Acetone Solubility a New Physical Constant.*—E. Louise and E. Sauvage suggest a new physical constant for fixed oils, which depends on the observation that when a small quantity of acetone is added to a fixed oil the mixture separates, on standing, into two layers, from the formation of a "double mixture." At a given temperature the amount of oil found in a given weight of both the upper and lower layer of liquid is found to be a constant, but different quantity, irrespective of the relative volume of oil and acetone originally mixed. These amounts of dissolved oil, although constant with that oil, vary with different kinds of oil, so that the method serves to identify oils or to detect the admixture of one oil with another. Thus, when 50 Gm. of colza oil is mixed with 80 Gm. of acetone, 1 Gm. of the upper layer,  $\alpha$ , contains 0.220 Gm. of oil at  $13^{\circ}$  C. and 1 Gm. of the lower layer,  $\beta$ , 0.449 Gm. With 50 Gm. of colza and 120 Gm. of acetone,  $\alpha$  gave 0.221 Gm., and  $\beta$ , 0.513. The amount of oil dissolved in  $\alpha$  is found to increase constantly with the temperature, while that in  $\beta$  diminishes; and at a certain temperature,  $15.4^{\circ}$  C. in the case of colza, a homogeneous solution, showing no separation, is obtained. This may be called the "critical temperature" of the oil, and may be determined for each oil; but a more convenient method is to find the miscibility with acetone, which is done thus: A known weight of the oil is introduced into a test-tube and 20 Cc. of acetone, measured at  $12^{\circ}$  C., is added. The tube is closed with a cork, carrying a thermometer graduated in  $0.1^{\circ}$  C. The mixture is then either warmed or cooled until a clear solution is obtained. This will occur suddenly, so that the readings may be made to  $0.2^{\circ}$  C. The weight of oil should be from 15 Gm. to 30 Gm. with 20 Cc. of acetone. If more than 30 Gm. of some oils be employed the mixture becomes too viscous to permit of sharp reading of the temperature. Characteristic curves of solubility may be obtained with varying weights, different oils, at different temperatures.—Pharm. Journ., Aug. 21, 1907, 291; from Compt. rend., 145 (1907), 183.

*Waxes—Characterization.*—Dr. Hugo Kühl gives a concise description of the characters of the different waxes and wax-like bodies, comprising white and yellow bees' wax, Chinese wax, Carnauba wax, Japan wax, cere-sine, ozokerite, various paraffins, Montan wax, and mixtures of bees' wax with other bodies, together with a brief description of their sources. This paper does not admit of condensation, and must therefore be consulted in the original, in Apoth. Ztg., xxii (1907), No. 104, 1136–1137.

*Saponification Number of Oils—A New Saponification Solution.*—N. Rusting recommends a solution of potash soap and potassium hydroxide in place of the alcoholic potash solution usually employed for determining the saponification number of oils. The solution is prepared as follows: The necessary quantity of KOH for 1 liter of normal lye is dissolved in its own weight of water; this solution is poured into about three-quarters of a liter of absolute alcohol, shaken, and the mixture set aside for a few hours. After filtration, sufficient olive oil (about 160 Gm.) to combine with about half of the potassium hydroxide is added. The whole is vigorously shaken until combination takes place; should complete saponification not occur at once the liquid is allowed to stand until the following day, when it is made up to a liter with absolute alcohol and titrated. To determine the saponification value about 1 Gm. of the oil to be examined is mixed with 25 Cc. of the alcoholic alkali soap solution, boiled over a small flame for three minutes, when it is titrated back directly with acid. By the use of a suitable flask and a well-regulated flame not more than 3 Gm. of alcohol need be lost, which for this purpose is of no consequence. Experiments show that the results obtained by this method agree closely with those obtained in the ordinary way. For yellow bees' wax it is necessary to boil for fifteen minutes. Ordinarily the saponification may be conducted in the cold by placing the oil and the lye in a stoppered flask, shaking until clear, allowing to stand for two hours and titrating.—Pharm. Centralh., xlix (1908), No. 22, 428; from Pharm. Weekbl., 1908, 433.

*Oleic Acid—Presence, Detection and Removal of Iron.*—In the course of experiments with the blood-pressure-raising principles of the suprarenal gland—to which, for the sake of convenience in reference, A. Gunn and E. F. Harrison apply the name of "adrenine"—it was observed that when it was mixed with oleic acid, a greenish-brown coloration was produced. Suspecting the coloration might be due to an impurity in the oleic acid, four samples were obtained from different sources. Two of them, quite pale in color, gave only a very slight coloration with "adrenine," slowly developing a slight, purplish tint on standing; a third, which was fairly pale, gave a greenish-brown color, slowly appearing in the cold, more rapidly if heated on the water-bath; but the fourth sample, which had a fairly strong brown color produced a purplish tint almost immediately on adding a little to some "adrenine" solution, which changed on standing to a fine violet-purple; this was very stable, and was scarcely changed on standing twenty-four hours. Further examination showed that iron was present in each sample of oleic acid, the amount being approximately proportional to the color of the acid. The iron may be removed from the oleic acid by shaking it well with warm dilute solution of potassium ferrocyanide, acidulated with hydrochloric acid; a blue precipitate appears at once. After a few minutes' shaking, the oleic acid is separated from the aqueous layer, washed two or three times with hot distilled water, and fil-



tered through paper. If much iron is present, this procedure should be repeated. So purified, the oleic acid gives no color with "adrenine," either in the cold or on warming; but if the purified oleic acid is shaken with iron filings, and allowed to remain in contact with them for several days, it assumes a dark-red color, and produces a greenish-brown color, with "adrenine" solution, like that produced with the third sample above mentioned, and is doubtless due to the presence of ferrous oleate. The violet-purple color is due to the presence of ferric iron.—Pharm. Journ., Aug. 3, 1907, 181.

*Sodium Oleate*.—Some commercial preparations containing sodium oleate are discussed by M. I. Wilbert, in the "Proceedings" of this Association, 1907, 120-123.

*Bay-Berry Fat (Oleum Lauri, G. P.)—Chemistry*.—The conflicting statements concerning the composition of the so-called bay-berry oil, have induced Hermann Matthes and Heinrich Sander to undertake a chemical investigation. This oil or fat is obtained by a process of boiling and expression from fresh or dried bay berries, and forms a green, ointment-like, granular mass, having a strong odor of the berries and a bitter balsamic taste. The sample under examination responded to the requirements of the G. P. IV. It yielded 2.43 per cent. of volatile oil, and gave the following constants: Acidity, 9.4; saponification number, 200.9; Reichert-Meissl number, 3.2; Polenske number, 2.8; Hehner number, after subtracting unsaponifiable, 85.8; Hübl iodine number, 82.2-82.43; refraction  $n_{D_{40}^{\circ}}$ , 1.4643; acetyl number: true = 5.108, apparent = 15.33. The unsaponifiable matter, amounting to about 1 per cent. of the fat, was found to consist of: *melissyl alcohol* ( $C_{30}H_{62}O$ ); *lauran*, a solid hydrocarbon ( $C_{20}H_{42}$ ); a *phytosterin* ( $C_{27}H_{44}O + H_2O$ ); and a liquid fraction, yellowish-brown, thick and oily, having an aromatic odor. It gave the Hübl iodine number 191.95, and must be regarded to be an unsaturated oil body or a mixture of various compounds.—Arch. d. Pharm., 246 (1908), No. 3, 165-177.

*Bear's Grease—Product from the Himalayan Bear*.—David Hooper has had opportunity to examine two samples of fat obtained from the Himalayan black bear (*Ursus torquatus*), which is locally known as *Balu-ke-cherbee*. Both samples had a yellowish-white color, a rancid odor, and a soft, granular and pasty consistence at 21° C. The following constants were obtained:

	No. 1.	No. 2.
Specific gravity at 50° (F.).....	0.9013	0.9007
Melting-point .....	37.5°	34.5°
Acid value .....	13.8	33.19
Saponification value .....	203.8	204.25
Iodine value .....	55.77	62.8
Reichert-Meissl value.....	0.93	0.86

The fatty acids afforded the following constants :

Percentage .....	94.78	93.81
Melting-point .....	42°	40°
Saponification value ...	205.64	207.37
Iodine value .....	57.28	62.98

The fats possessed distinct drying properties. From the above constants and a more detailed examination of the fatty acids, it is apparent that the fat of the Himalayan bear consists chiefly of olein and palmitin, and agrees in many of its properties with lard or pig's fat.—Pharm. Journ., June 20, 1908, 803-804.

*Ground-nut Oil—Preliminary Test for its Presence in Other Oils.*—The "Bayer. Ind.-u. Gewerbeblatt" (1907, 99,) publishes the following preliminary test for the presence of ground-nut oil in olive oil and other fixed oils: 0.65 Cc. of the oil under examination and 5 Cc. of alcoholic potash (33 Gm. KOH in 1000 Cc.) are boiled together for two minutes; the evaporated alcohol is replaced by absolute alcohol, and the solution allowed to stand at a temperature of 19°-20° C. The presence of 10-15 per cent. of ground-nut oil in olive or poppy oil is indicated by the formation of a flocculent precipitate, but in ricinus oil this is not formed above the temperature of 0° C. If the solution remains clear, further examination is not necessary.—Pharm. Ztg., lii (1907), No. 72, 749.

*Lard—Detection of Foreign Fats.*—A. Leys recommends the following method for the detection of foreign fats in lard: Two Gm. of the fat is weighed into a flask, 4 Gm. of mercuric oxide is added, and 50 Cc. of glacial acetic acid; the mixture is boiled, under a reflux condenser, for five minutes. It is then cooled for two hours, when mercurous acetate and the solid glycerides crystallize out. The mixture is again warmed to 50° C. on the water-bath and 50 Cc. of alcohol is added. After thorough agitation the mixture is set aside all night. The separated glycerides are then collected on a small filter, washed with 100 Cc. of alcohol and dried in the air. The dry residue is then extracted with 50 Cc. of benzene, which removes the glycerides, leaving the mercurous acetate insoluble. The solvent is then evaporated off and the characters of the usual residue taken. Of these the melting-point is a most useful factor for this purpose. Any lard which gives solid glycerides by this method with a melting-point below 60° C. is considered to be of doubtful purity. The simple addition of oil to lard does not affect this melting-point. The following are the points of fusion of the glycerides obtained from the fats named by this method: Beef fat, 55.8° C. to 56.2° C.; veal fat, 53° C. to 53.4° C.; mutton fat, 57.4° C.; horse fat, 53° C.; oleomargarine, 52.6° C.; lard, 60.4° C. to 60.8° C.; market butter, 49° C. to 52° C.; cacao butter, 55.8° C. to 58.6° C.; coco-nut oil, no solid glycerides; cotton-seed margarine, 55.8° C.—Pharm. Journ., Aug. 31, 1907, 315; from Compt. rend., 145 (1907), 199.

*Castor Oil—Determination in Oil Mixtures.*—N. J. Lane recommends the following method for the determination of castor oil in mixtures, which depends on the insolubility of lead ricinoleate in petroleum ether: From 3 to 3.5 Gm. of the mixture of oils or fats is saponified, the soap carefully neutralized, the product added to 200 Cc. of boiling water, and precipitated while boiling with 30 Cc. of 10 per cent. solution of lead acetate. The dried precipitate is extracted with petroleum ether (b. p., 40° C.), the solution diluted to a specific volume, and the fatty acids contained in it, determined by titration in the usual way, are calculated as oleic acid. From the figures so ascertained the amount of ricinus oil is calculated by difference, taking into consideration that most of the other oils contain about 80 per cent. of liquid acids.—Pharm. Ztg., lii (1907), No. 80, 841; from Chem. Centralbl., 1907, ii, No. 12.

*Olive Oil—Influence of Oxygen, Nitrogen, Light and Darkness.*—Leon A. Ryan and John Marshall have been led by the variations of the iodine and saponification numbers of olive oil to examine into the influence of such factors as oxygen, nitrogen, direct sunlight, diffuse sunlight and darkness as affecting the analytical constants and at the same time their influence upon the production of rancidity. The results of the experiments, which are described in detail, demonstrate that the influence of oxygen on olive oil is to decrease the iodine number and at the same time to increase the saponification number. It also acts decidedly towards causing the oil to become rancid, and diminishes the original intensity of its color. The unsterilized oil exposed to diffused sunlight yielded a slightly higher iodine number than the sterilized oil exposed in the same way, but the latter oil gave a slightly higher saponification number. Kept in darkness, the sterilized oil gave a slightly higher iodine number than when it was exposed to diffused sunlight, while the latter gave a somewhat higher saponification number than the sterilized oil kept in darkness. As to the influence of nitrogen, whether under conditions of sterilization or unsterilization, practically no change is caused in the iodine number, but there is an increase in the saponification number in the case of sterilized oil. This change, however, is probably not due to nitrogen, but to a cleavage of a portion of the oil that may occur at the temperature of sterilization. In every case with the flask containing an atmosphere consisting wholly of nitrogen the oil remained sweet and without the slightest indication of its having become rancid. From experiments performed with oleic acid, Winkel concluded that fats do not become rancid because of the action of enzymes, but that of first importance in the production of rancidity is the oxidizing action of oxygen. The experiments described in this paper confirm the view of Winkel.—Amer. Journ. Pharm., July, 1907, 308–315.

*Peach-kernel Oil—Adulteration.*—According to C. T. Bennett, what is usually described as "*oleum amygdalæ persicæ*" is the oil expressed —

from either peach or apricot kernels, or a mixture of both. Owing to the present scarcity of these kernels, considerable quantities of adulterated oils and substitutes are offered on the market—principally refined poppy-seed oil (recently also hazel-nut oil) which can easily be detected by the iodine value. The following are the limits of iodine value within which possible substitutes usually fall :

Oil.	Iodine-value.
Almond .....	93-97
Peach .....	93-109
Apricot .....	96-108
Hazel-nut .....	83-90
Poppy-seed .....	133-143
Walnut .....	145
Hempseed .....	148
Sunflower-seed .....	119-135
Safflower .....	130-150

—Chem. & Drugg., Jan. 18, 1907, 89.

Since the above observations were made, Mr. Bennett has found that cottonseed and arachis oils are now being used for the sophistication of peach-kernel oil. Cottonseed oil is readily determined by Halphen's test; arachis or nut oil by Renard's test. The melting-point of the fatty acids is materially affected by the addition of nut oil and cottonseed oil, but the iodine value does not indicate the admixture as in the case of poppy-seed oil. The following figures show the effect on adulterated oil:

	Iodine Value.	M. P. Fatty Acids.
Pure peach kernel .....	93-109	10°-18° C.
Peach kernel, adulterated with cottonseed .....	112.4	39° C.
Peach kernel, adulterated with nut oil .....	103.6	31°-32° C.
Peach kernel, adulterated with poppyseed .....	131.7	22° C.
Arachis oil .....	83-100	27°-32° C.
Cottonseed oil .....	108-110	35°-39° C.
Poppyseed oil .....	133-143	19°-22° C.

—Ibid., June 27, 1908, 981.

*Tonquin Butter—Characters and Constants.*—The fatty matter of tonka beans, which is used in confectionery, and is a somewhat important article of commerce between Holland and other countries, has been subjected to analysis by M. Duyk, who describes it as having the appearance of a waxy mass, of a yellowish color, becoming orange. Its odor is pleasant, and is attributed to the presence of coumarin, which may be extracted by treating some grammes of the substance with a little hot water and filtering while hot. In a few hours the cooled filtrate is full of matted, fine, white crystals, melting at 68° to 69° C. The melting-point of the butter is 28° C.;

refractive index (Zeiss-Abbe),  $47^{\circ}$  C.; specific gravity ( $100^{\circ}$  C.), 0.888; saponification number, 257; soluble volatile acids, 5.4; it also contains a notable quantity of insoluble volatile acids.—Pharm. Journ., June 6, 1908, 760; from Rép. de Pharm., May 10, 1908.

## CARBOHYDRATES.

*New Carbohydrate—Occurrence in Elm Tree Galls*, which see under "Materia Medica."

*Carbohydrates—Color-Reactions with Chlor-auric Acid*.—P. Leidler has made some observations concerning the action of various sugars and carbohydrates upon gold chloride, which are interesting in connection with Reichardt's observations on the recognition of reducing substances in urine (which see) by means of gold and sodium chloride. Leidler has found that under certain described conditions, dilute solutions of chlor-auric acid are reduced by lactose, maltose, cellulose, starch, levulose, inulin, dextrin, and dulcitol, with development of more or less pronounced rose, blue violet or red colors. Solutions of gold and sodium chloride are also reduced by the carbohydrates mentioned, but the reaction takes place with far less facility than with the acid gold chloride.—Pharm. Ztg., liii (1908), No. 11, 110; from Kolloid-chemie, ii, 10.

*Starch Grain—Structure*.—In a previous paper (see Proceedings, 1907, 908) Prof. Henry Kraemer has shown that the peripheral layer of the potato starch grain breaks and recurves on treatment with certain reagents, much like the cutin layer of an epidermal cell on treatment with sulphuric acid. While he had previously observed that this peripheral layer is stained with certain of the aniline dyes, he thought that the effect might probably be due to the remains of plastids or protoplasmic material, rather than to the presence of a distinct membrane. But from observations now recorded in a second paper, he is satisfied that it can be demonstrated that the peripheral layer of the starch grain is a distinct membrane. This brings up the consideration of the view of Raspail, in connection with those of others, in regard to the nature of the starch grain, which may be summarized as follows:

1. The starch grain consists of a membrane which is insoluble in water, and a more or less soluble content, as pointed out by Raspail.
2. It develops from a centric or excentric point, to which layer after layer is added, a view first advanced by Fritzsche, and subsequently enlarged upon by Schimper, who demonstrated that its growth is dependent upon the function of leucoplastids.
3. The content of the grain consists of at least two different substances, as first pointed out by Nägeli, and later by Meyer, Schimper and others, who showed in addition that the structure might be compared to that of spherocrystalloids.

Summing up this observation on the behavior of iodine and starch, it

seems to the author that we are dealing with a chemical compound of iodine and soluble starch; but that the combination is a feeble one, being easily dissociated upon the application of heat, and the iodine being more or less volatilized. Also, the facility with which soluble starch takes up the iodine in a chloroformic solution, indicates that the affinity of starch for iodine is considerably greater than heretofore supposed.—*Amer. Jour. Pharm.*, Sept., 1907, 412-418.

*Pectin and Protopectin.*—*Characterization.*—In a former study concerning the formation of pectin in fruits, Professor Tschirch had demonstrated that in the case of the fruits of *Sambucus nigra* the seat of the "pectin-metamorphosis" exists undoubtedly in the intercellular substance. Continuing his studies, he has now extended them, with the collaboration of Mr. Rosenberg, to the pectin-formation in other fruits: *Cydonia vulgaris*, *Ribes rubrum*, *Ribes grossularia*, *Pirus malus* and, supplementary, to pears, plums, strawberries, raspberries and whortleberries. The results demonstrate that two bodies are distinguishable in the intercellular substance: the "normal intercellular substance," characterized by being dyeable with certain dye-stuffs and by being *insoluble in sugar solution*, and the "actual pectin substance," which is derived from the first-named body by the ripening of the fruits, and is characterized by not being dyeable and by being *soluble in sugar solution*. Whether, or not, the "intercellular substance"—which includes also the cellular coating—is to be regarded as "calcium pectate," is an open question. The author has named this body "*protopectin*," thus characterizing it as being the mother substance of pectin. According to this view, the "intercellular substance" is composed of *protopectin*; the "cellular coatings," and probably also the flabelliform divisions, of *pectin* and *protopectin*; the actual pectin-membranous layer, of *pectin*. There is little doubt that both protopectin and pectin are to be regarded as hemicelluloses, since Tromp, de Haas and Tollens have demonstrated already that the pectins isolated by them yielded arabinose on hydrolysis. It is not probable, however, that the pectins heretofore isolated were perfectly pure substances, since the mucilaginous constituents of the membranes and cell-contents also entered solution. The solubility relations of the two bodies toward sugar solutions now afford a method for obtaining them in a pure condition, and thus facilitate a more accurate study of their characters and chemical relations. such being now in progress.—*Schweiz. Wechschr. f. Chem. u. Pharm.*, xlv (1907), No. 40; from *Ber. d. D. Pharm. Ges.*, 17 (1907), No. 6.

*Sugar—Determination.*—S. Ito recommends that the cuprous oxide produced in sugar determinations by Allihn's modification of Fehling's method be weighed as such, and the corresponding weight of copper calculated from the figures obtained. He bases his recommendation on the observation that the cuprous oxide is not appreciably reduced in weight even when exposed to 90°-100° C. for 4 hours on drying it.—*Pharm. Ztg.*, liii (1908), No. 11, 110; from *Jour. Pharm. Soc. of Japan*, 1907, No. 310.

**Milk Sugar—Detection of Saccharose and Glucose by the Fermentation Test.**—O. Anselmino, taking advantage of the unfermentability of lactose with yeast, suggests the detection of saccharose and glucose in milk sugar by the aid of the fermentation saccharometer, as follows: A solution of 1 Gm. of the milk sugar in 9 Gm. of water is mixed with 0.2 Gm. of fresh compressed yeast and exposed to a temperature of  $20^{\circ}$  to  $30^{\circ}$  C. in the fermentation saccharometer. In the absence of saccharose or glucose no  $\text{CO}_2$  should be developed within 2 days' exposure. It is quite possible to determine the presence of 2–3 per cent. saccharose by this method without difficulty, 1 per cent. with some care, and even much less if a very sensitive apparatus is used.—Pharm. Centralh., xlix (1908), No. 6, 99–101.

**Fermentation Saccharometer—Simple Form.**—A. Basler recommends the fermentation saccharometer shown by Fig. 72, which is easily cleaned,

FIG. 72.

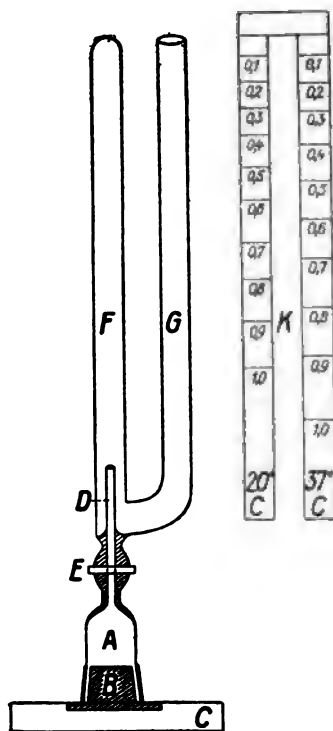


FIG. 73.



Fermentation Saccharometers.

conveniently used, and accurate in results. The reservoir for 5 Cc. of diabetic urine mixed with yeast (A) is closed at the wide end with a glass stopper (B), the flat head of which extends beyond the circumference of the reservoir whereby it is held in a socket on a wooden base (C), weighted with lead. The opposite end of the reservoir is constricted to

the size of a small tube, leading to a stop-cock (*E*) from which a glass tube (*D*), 3 Cm. in length and 2 Mm. in diameter, leads into the limb (*F*) of the saccharometer intended for the collection of the carbon dioxide, which is closed at the top; whilst a second, open-ended, limb (*G*) extends laterally and upwards from this, immediately above the stop-cock—both limbs having a diameter of about 1 Cm. The capacity of the reservoir is such that an air-space the size of a small bubble remains after 5 Cc. of the urine has been introduced and the stopper inserted. The glass tube *F* is then filled with saturated salt solution, which cannot descend into *A* on opening the stop-cock *E* because of the air enclosed in the small communicating tube *D*, through which the carbon-dioxide generated passes into tube *F*, and bubbling through the salt solution, is collected, a corresponding volume of the solution collecting in the open limb *G*. The percentage of sugar contained in the sample may then be at once ascertained by the aid of the rider-scale (*K*) supplied with the apparatus, one limb of which gives percentages at 20° C., the other at 37° C. The absorption of carbon-dioxide by the salt solution is so small as to be negligible; nor is it considered necessary to make any correction for differences in barometric pressure. The apparatus, which is available for accurate determination even in 0.1 per cent. solutions of sugar, is supplied by Otto Ludwig (Tübingen).—*Pharm. Ztg.*, lii (1908), No. 71, 67–68; from *Münch. Md. Wchr.*, 1907, No. 50.

*Fermentation Saccharometer—Convenient Form.*—Dr. Weidenkaff has devised the fermentation saccharometer shown by Fig. 73 which is protected by a German patent. The novelty of this resides mainly in the expanded funnel-shaped limb, into which the liquid from the stoppered measuring cylinder is forced during the fermentation and collected without spilling. This funnel-shaped limb, furthermore, is provided with a small lateral tube for the reception of the mercury which is used as a seal in the constricted portion of the apparatus during the reaction. The mercury is collected in this when the apparatus is to be emptied and secured by means of a rubber stopper during the cleaning process.—*Pharm. Ztg.*, liii (1908), No. 22, 220.

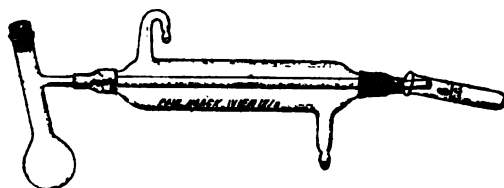
*Raffinose—Occurrence in the Leaves and Twigs of Taxus Baccata.*—H. Hérissey and Ch. Lefebvre have determined the presence of raffinose ( $C_{18}H_{32}O_{16} + 5H_2O$ ) in the vegetable portion (leaves and twigs) of *Taxus baccata*. This sugar, which is now known to be identical with the sugar isolated by Johnston in 1843 in an Australian manna, and studied, under the name of "Melitose," by Berthelot in 1855, was first described under the name of "Raffinose" by Loiseau in 1876, who obtained it as a characteristic crystalline constituent of beet-root molasses. Subsequently (1885) the saccharine constituent of cotton-seeds was isolated and described by Boehm, who called it "Gossypose," and independently (1884) by Ritthausen, who believed it to be identical with the "Melitose" of



Berthelot. It is probable also that this sugar is a constituent of the seeds of *Soja hispida*, and it is a constituent also of barley and of the manna of *Eucalyptus Gunnii*, Hook. The present authors have obtained the raffinose in a well-crystallized condition in the course of the extraction of a new glucoside, "Taxikatin" (which see under "Glucosides"), and have established its identity beyond dispute. It is characterized by its powerful dextro-rotatory action ( $\alpha_D = +102.49^\circ$ ), by yielding mucic acid when treated with nitric acid, and by being split up on hydrolysis into three distinct sugars, namely, dextrose, levulose and galactose. The authors have, furthermore, found that raffinose is not the only sugar present in the vegetable portions of *Taxus baccata*, but that

*Saccharose*, in the free state, is also a constituent. It was observed that the rotatory power of the total sugars regenerated from the barium compound obtained in the course of the investigation was only about one-half as great as that of the pure raffinose, and by suitable means they succeeded in isolating from this mixture of sugars very characteristic, although microscopically small, crystals of cane-sugar. The simultaneous presence of the two sugars in the same plant has been observed before in several instances and, similarly, in gentian, which contains both cane-sugar and "gentianose."

FIG. 74.



Apparatus for Determining Pentoses.

But the latter, though isomeric with raffinose, splits up only into levulose (1 mol.) and dextrose (2 mols.).—Arch. d. Pharm., 245 (1907), No. 7, 481-485.

*Pentoses—Positive Determination in Urine.*—A. Jolles employs Bial's reagent (orcin-hydrochloric acid containing  $\text{FeCl}_3$ ) for the detection of pentoses in urine, with positively reliable results by conducting the process as follows: 15 Cc. of the urine are heated for one hour in a boiling water-bath with 1 Gm. of hydrochloride of phenylhydrazine and 2 Gm. of sodium acetate. The flask is then placed in cold water for two hours, the precipitate formed collected on an asbestos filter, washed with 3-4 Cc. of water, and transferred with the asbestos into a small distilling flask (about 50 Cc. capacity) with a long outlet-tube (see illustration, Fig. 74), rinsing the funnel with 20 Cc. of water and 5 Cc. of concentrated HCl (sp. gr., 1.19). The distilling flask is then securely attached to the condenser, as shown in the cut, and 5-6 Cc. of distillate is collected in a test-tube. On boiling one-half of the distillate so obtained with about 6 Cc. of Bial's reagent, a distinct green color is developed if it contains as little

as 0.05 per cent. of pentoses, which are thus positively indicated. In the original paper the author also describes a new method which he has devised for the quantitative estimation of pentoses.—*Pharm. Ztg.*, liii (1908), No. 11, 110; from *Ztschr. f. anal. Chem.*, 1907, 764.

#### ORGANIC ACIDS.

*Organic Acids—A New Class of Iron Salts.*—L. Rosenthaler and A. Siebeck describe a new class of organic iron salts, which are obtained by precipitation from aqueous solutions of the neutral alkali salt of a number of organic acids—tartaric, oxalic, citric, etc.—by means of a 5 or 10 per cent. solution of ferric nitrate in excess, washing the precipitate, first by decantation, then with the aid of a Pukal-cell, and finally drying in a vacuum over sulphuric acid. Referring to the original for details, both as to preparation and characterization, the following brief description of the composition and physical characters of the several salts may be given:

*Basic Ferritartrate*,  $2[\text{Fe}_2(\text{C}_4\text{H}_4\text{O}_6)_3] + 3\text{Fe}(\text{OH})_3 + 3\text{H}_2\text{O}$ : Oker-yellow when moist; brownish-yellow amorphous powder when dried; gradually decomposes under the influence of light, or when heated on a water-bath. Sparingly soluble (1:640) in water, insoluble in alcohol; soluble in alkali tartrate.

*Basic Ferricitrate*,  $6(\text{FeC}_6\text{H}_5\text{O}_7) + 7\text{Fe}(\text{OH})_3 + 9\text{H}_2\text{O}$ : Light-yellow powder, permanent on exposure to light and heat ( $100^\circ\text{C}.$ ); much less soluble in water than the tartrates (1:45450), but soluble in solution of alkali citrate.

*Basic Ferrioxalate*,  $\text{Fe}_2(\text{COO})_2 + 7\text{Fe}_2\text{O}_3 + 9\text{H}_2\text{O}$ : Yellow-red amorphous powder, not affected when heated to  $100^\circ\text{C}.$ , and not materially affected when exposed to light. Solubility in water quite as difficult as the citrate, and insoluble in alkali oxalate.

*Basic Ferrimalate*,  $\text{Fe}_2(\text{C}_4\text{H}_4\text{O}_6)_3 + 2\text{Fe}(\text{OH})_3 + \text{H}_2\text{O}$ : Yellow amorphous powder, not changed when heated to  $100^\circ\text{C}.$ ; soluble in 975 p. of water; insoluble in alcohol. Soluble in alkali malate.

*Ferromalate*,  $\text{Fe}(\text{C}_4\text{H}_4\text{O}_6)_3$ , and *Neutral Ferrimalate*,  $\text{Fe}_2(\text{C}_4\text{H}_4\text{O}_6)_3$ , were not obtainable in pure condition, the first containing ferric salt, the last-named oxal-acetic acid and ferrous salt.—*Arch. de Pharm.*, 246 (1908), No. 1, 51-57.

*Organic Acids—Determination in Fruit Juices, Etc.*—Gunner Joergensen recommends the following method for the detection and determination of organic acids in fruit and plant juices: The fruit juice or wine is neutralized and treated with lead acetate solution 20 per cent., and 90 per cent. alcohol. The washed precipitate is then decomposed with hydrogen sulphide; the lead sulphide is filtered out, and the filtrate, neutralized with caustic potash, is again treated with alcohol, and evaporated. Tannin and also sulphuric and phosphoric acids are for the most part precipitated. The alcoholic filtrate is then treated with acetic acid, which precipitates tartaric acid as potassium acid tartrate. After removing this and

evaporating off the alcohol, any succinic acid is obtained from the aqueous residue after acidifying with hydrochloric acid and shaking out with ether. The aqueous portion, freed from ether, is treated with 10 per cent. barium chloride solution, which removes the rest of the sulphuric and phosphoric acids. The filtrate from these is then treated with a little alcohol, when citric acid is thrown out as barium citrate. This having been removed, the addition of more alcohol causes the separation of malic acid. The precipitates of the barium salts of the two last acids must be redissolved and reprecipitated to obtain them pure. In each case the acid is liberated and titrated with  $\frac{N}{10}$  alkali.—Pharm. Centralh., xlviii (1907), No. 31, 642; from Ztschr. f. Untersuch. d. Nahr.-u. Genussm., xiii, 1907, 241.

*Organic Acids—Determination in Wines, together with Alcohol and Glycerin.*—A. Heiduschka and G. Quincke communicate the details of a method which they have successfully employed for the quantitative determination of alcohol, acetic, lactic, tartaric, malic and succinic acids, in the presence of glycerin. Omitting the details, the method is briefly outlined as follows: A portion of the mixture (wine) is neutralized, the alcohol is distilled off, and the alcohol content in the distillate, after oxidation with potassium dichromate and sulphuric acid, determined iodometrically. In another portion of the wine the acetic acid is separated in the usual manner by steam distillation and determined in the distillate by titration. For the separation of the lactic acid, advantage is taken of the ready solubility of its barium salt in 80 per cent. alcohol, and the sparing solubility of the barium salts of the remaining acids. At this stage of the process, it becomes necessary also to determine the glycerin, which is taken up along with the barium lactate. To this end a portion, in alkaline solution, is subjected to distillation in a partial vacuum, and the glycerin determined in the oxydymetric way, whilst in another portion the sum of glycerin and lactic acid is determined directly by the oxydymetric method. In the mixture of barium tartrate, malate and succinate, remaining after the separation of the lactate, the tartaric acid is determined as potassium bitartrate; the malic acid, after the removal of the bitartrate, is titrated with potassium permanganate, and the succinic acid, by reason of its resistance to oxidation, may be separated directly from the oxidized mixtures by shaking out with ether.—Arch. d. Pharm., 245 (1907) No. 6, 458-461.

*Wine Vinegar—Glycerin Content not a Reliable Criterion of Quality and of Source.*—Jonscher having suggested the estimation of the glycerin content of wine-vinegar as affording a reliable criterion of its source and quality, which he based on the ground that glycerin is a natural constituent of all wines, fairly uniform in quantity, and not affected by the acetous fermentation, W. Fresenius has recently questioned the reliability of the method, basing his opinion on the observation that although glycerin will in many instances withstand the action of acetous fermentation, in others,

under apparently like conditions, it suffers partial decomposition. H. Lübrig now records the results of a comprehensive series of experiments, which confirm the opinion of Fresenius in every particular. It appears to be customary to subject a mixture of natural wine and of diluted alcohol (12 per cent.) to acetous fermentation by the quick-vinegar process. If these are used, for example, in equal volumes, the glycerin in the finished vinegar should amount to just one-half that contained in the wine. The numerous experiments of Lübrig, however, show that an appreciable loss of glycerin always occurs, amounting in some instances to over 50 per cent., and that therefore the estimation on the basis of the glycerin content does not afford a reliable criterion of the quality of wine-vinegars.—*Schweiz. Wchschr. f. Chem. u. Pharm.*, xlv (1907), No. 42, 863–868.

*Acetone—New Reaction Applicable to its Detection in Urine.*—Ricci recommends a new reaction for the detection of acetone in urine, which depends on the color reaction produced by acetone with ammonia, acetic acid and an alkaline cyanide. To 10 Cc. of the urine, 10 drops of acetic acid and 10 drops of a freshly-prepared saturated solution of sodium cyanide are added; then, very carefully, a few drops of ammonia are allowed to flow into the mixture. If acetone is present a beautiful violet-colored ring is formed at the contact-zone of the two liquids. It is said to be possible by this reaction to detect the presence of as little as 15 to 20 Mgm. of acetone in a liter of the urine. In this connection, however, it must be remembered that in normal urine as much as 10 to 20 Mgm. of acetone may be eliminated daily.—*Pharm. Ztg.*, liii (1908), No. 38, 380; from *Münch. Med. Wschr.*, 1908, No. 18.

*Acetone.*—Interference of Albumins with the Iodoform Reactions. See “Albumen: New Reaction,” under “Albuminoids.”

*Acetone.*—A Simple Method and Apparatus for its Detection in Urine, which see under “Albuminoids.”

*Acetone—Solvent Action on Cork Stoppers.*—E. A. Barrier calls attention to possible errors occasioned by the use of cork stoppers in making extractions with acetone. On subjecting thinly-sliced cork to extraction with acetone during 5 hours, he obtained about 5 per cent. of a white resinous mass on evaporating the acetone solution. This quantity is sufficient, particularly in caoutchouc examinations, to materially vitiate the results of the analysis. If glass stoppers, which are preferably used for acetone extractions, are not available, it is, therefore, recommended that the cork stoppers be extracted for several hours with acetone before using them for this purpose.—*Pharm. Ztg.*, lii (1907), No. 90, 941; from *Chem. Centralbl.*, 0197, ii, No. 17.

*Benzoic vs. Cinnamic Acid—Caution in Food Analysis.*—A recent finding that some highly flavored sweet pickles were preserved with benzoic acid gave the occasion for an investigation by Wilbur L. Scoville, which

led to the conclusion that the close resemblance of cinnamic acid to benzoic acid appears to have been overlooked in this case, and that cinnamic acid derived from the oil of cinnamon used as a flavor was in reality the "*corpus delicti*." In such examinations it is difficult, if not impossible, to isolate the acids in a condition of purity sufficient for their absolute identification; but the two acids can be distinguished by the manganous test, as follows: If a precipitate is obtained with ferric chloride in neutral solution, the liquid should also be tested with solution of manganous sulphate (or chloride). A precipitate with this, after an hour's standing, shows cinnamic acid. If no precipitate occurs, benzoic acid is indicated.—*Amer. Journ. Pharm.*, Dec., 1907, 549-551.

*Cinnamic and Benzoic Acids—Separation and Estimation.*—K. Scheringa recommends the following method for the separation of benzoic and cinnamic acid from each other, and their estimation, which depends on the difference in the solubility of their calcium salts and in the oxidizing effect of permanganate upon them. About 0.7 Gm. of the mixed acids is dissolved in ammonia, diluted with water to 30 Cc., and the solution treated with calcium chloride, which precipitates the greater part of the cinnamic acid. The precipitated calcium cinnamate is removed by suction filtration, and the filtrate and washings are treated, drop by drop, with solution of permanganate (1:50) to a permanent red color, which is immediately removed by the addition of thiosulphate solution. After gently heating the mixture, the precipitated manganese hydroxide is removed by filtration and washed; the filtrate and washings are boiled to remove the benzaldehyde formed, and, after acidulation with HCl, shaken out with ether—this process being repeated several times with fresh portions of acid and ether. On evaporating the ethereal solution all the benzoic acid in the sample is obtained—its ascertained weight, deducted from the original weight, giving the quantity of cinnamic acid.—*Pharm. Ztg.*, lii (1907), No. 72, 748; from *Pharm. Weekbl.*, 1907, No. 33.

*Benzoic Acid—Quantitative Estimation in Catsup.*—Chas. H. LaWall and Henry A. Bradshaw communicate a process for the estimation of benzoic acid in catsup, in which the annoyance and trouble incident to the tendency to emulsification and the necessity of sublimation of the benzoic acid obtained by the shaking-out process are avoided. The process gives concordant results, agreeing within one or two-hundredths of 1 per cent.; but the description of the process cannot be condensed, and must therefore be consulted in the original, in *Amer. Journ. Pharm.*, April, 1908, 171-172.

*Benzoates—Solubilities.*—R. Paietta has determined the solubilities of the following benzoates:

*Strontium Benzoate.*—This salt occurred as a coarse, crystalline powder, and contained 1 mol. of water, which it slowly lost at 130° to 140° C.

100 Gm. of the solution, saturated at 15.7° C., contained 5.31 Gm. of anhydrous salt; at 24.7° C., 5.40 Gm.; at 31.4° C., 5.56 Gm.; and at 40.9° C., 5.77 Gm.

*Potassium Benzoate*.—This crystallized with 3 mols. of water. 100 Gm. of solution, saturated at 17.5° C., yielded 41.1 Gm.; at 25° C., 42.4 Gm.; at 33.3° C., 44.0 Gm.; and at 50° C., 46.6 Gm. of anhydrous salt.

*Neutral Lead Benzoate*.—This contains 1 mol. of water of crystallization. 100 Gm. of solution, saturated at 18.0° C., contained 0.149 Gm.; at 40.6° C., 0.249 Gm.; and at 49.0° C., 0.310 Gm. of anhydrous salt.

*Zinc Benzoate*.—This is anhydrous. 100 Gm. of solution, saturated at 15.9° C., contained 2.55 Gm.; at 31.3° C., 2.05 Gm.; at 49.8° C., 1.62 Gm.; and at 59° C., 1.45 Gm. of anhydrous salt. It is therefore more soluble in cold than in warm water.—Pharm. Journ., Aug. 31, 1907, 315; from Boll. Chim. Farm., through Jour. de Phar. et Chim., 25 (1907), 63.

*Bismuth Benzoate—Preparation*.—Instead of preparing bismuth benzoate by the direct action of benzoic acid upon bismuth hydroxide, as is usual, Gwindal finds it practicable to prepare this compound by double decomposition between bismuth nitrate (10 p.) dissolved in glycerin, and sodium benzoate (8 p.) dissolved in water. Instead of the glycerin solution, a solution of the bismuth nitrate in water acidulated with nitric acid may be used, but in this case it becomes necessary, after admixture of the two solutions, to neutralize with sodium hydroxide.—Pharm. Ztg., lii (1907), No. 97, 1015; from Rép. de Pharm., 1907, No. 11.

*Saccharin—Reaction with Alkaloids*.—G. Parmeggiani finds that solutions of quinine and of brucine are precipitated by neutral solutions of saccharin, but those of strychnine, morphine, and cocaine give no precipitate. Crystals of basic quinine saccharinate are obtained both from aqueous and ethereal solutions; those from the former are acicular, and from the latter rhombic tablets.—Pharm. Journ., April 4, 1908, 451; from Boll. Chim. Farm., 1908, 37.

*Saccharin—Extraction and Determination*.—G. Parmeggiani recommends the following method for the extraction and determination of saccharin: Fifty Cc. of the suspected liquid is evaporated to one-half, then shaken out with 30 Cc. of amyl acetate. The ethereal solution is separated, evaporated to a small volume, and mixed with a few drops of neutral lead acetate reagent. Any precipitate formed is filtered out, and excess of lead removed with hydrogen sulphide. The filtrate is then shaken out with 20 Cc. of acetic ether; after separation the solvent is evaporated, and the dry residue tested by taste and appropriate reagents for saccharin. For the quantitative determination 50 Cc. are treated as above, but the final extraction is made with 50 Cc. of a mixture of equal volumes of ether and petroleum ether as the immiscible solvent; this is employed in five or six successive washings; the dry residue from this is

then titrated with  $\frac{N}{50}$  alkali.—Pharm. Journ., April 11, 1908, 486; from Boll. Chim. Farm., 1908, 37.

*Citric Acid—A Normal Constituent of Wine.*—Comparative experiments made by A. Hubert with numerous wines of reliable purity and origin, has demonstrated the presence of citric acid in almost every sample. The author, therefore, believes the assumption justified that citric acid is a normal constituent of wine.—Pharm. Ztg., liii (1908), No. 48, 477; from Chem. C.-Bl., 1908, I, No. 21.

*Manganese Citrate—Conversion into Soluble Double Salts.\**—The N. F. directs manganese citrate for preparing solution of peptonate iron with manganese, but a soluble manganese citrate appears to be unobtainable on the market. Prof. Francis Hemm has experimented with the ordinary citrate of commerce, and finds it to dissolve readily if it is boiled with sodium citrate in water, or if it is heated with ammonia water. Both solutions, however, precipitated again on long standing, the ammonia compound keeping longer than the sodium double salt.—Proc. Mo. Pharm. Assoc., 1907, 104-105.

*Tartaric Acid—Determination in Presence of Malic and Succinic Acids.*—J. v. Ferentzy recommends the following method for the determination of tartaric acid in presence of malic and succinic acids, which is based upon the complete insolubility of its basic magnesium salt in 50 per cent. alcohol and the ready solubility of the corresponding malate and succinate in the same solvent. The solution of the mixed acids is concentrated to a small volume, alcohol is added to make a 50 per cent. dilution, followed by magnesia mixture, in quantity corresponding to the estimated tartaric acid content, and a certain excess of ammonia water. After readjustment of the solution to 50 per cent. alcoholic strength, it is well shaken, and set aside for 12 hours so that the precipitation of the basic magnesium tartrate may be complete. This, after washing with 50 per cent. alcohol, is dried, heated to redness, and the MgO so obtained is weighed. The ascertained weight, multiplied by the factor 1.875, gives the weight of tartaric acid in the sample—one mol. of the acid corresponding to 2 mol. MgO found.—Pharm. Ztg., lii (1907), No. 98, 1021; from Chem. Ztg., 1907, No. 90.

*Tartaric Acid—Detection in Cider.*—G. A. LeRoy recommends the following method for the detection of tartaric acid in cider: The liquid is neutralized, and lead acetate is added in excess. The lead precipitate is washed with cold water and decomposed by hydrogen sulphide. The filtered liquid is evaporated and neutralized (after the H<sub>2</sub>S has passed off) by means of sodium bicarbonate. It is then evaporated to dryness, and a solution of 1 per cent. resorcin in concentrated sulphuric acid is added. On warming, if tartaric acid is present, an intense violet-red coloration is produced. Citric acid gives no coloration; malic and lactic acids give a

\* See Proceedings, 1902, 937-938.

yellow coloration.—Chem. News, Jan. 24, 1908, 46; from Compt. rend., 145 (1907), No. 25.

*Antimony and Potassium Tartrate—Reaction with Iron and Aluminum Compounds.*—Franz Felix Werner finds that while solution of ferric chloride ( $\text{FeCl}_3$ ) gives with tartaric acid (in form of potassium or sodium tartrate) a fawn-colored precipitate only after some time, or when heated, the addition of the same reagent to cold solution of tartar emetic produces an immediate precipitate of an extremely characteristic egg-yellow color. The addition of an aluminum salt, for example aluminum chloride, also produces an immediate (white) precipitate in a cold solution of tartaric acid, whereas with cold solution of alkali tartrates no precipitate is produced by aluminum salts.—Pharm. Ztg., liii (1908), No. 5, 49.

*Sodium-Arsenyl-Tartrate—Preparation and Characters.*—Attention is called in E. Merck's Annual Rep. (1907) to sodium-arsenyl-tartrate, a compound analogous to potassium-antimonyl-tartrate (tartar emetic). It is obtained by saturating a boiling solution of sodium bitartrate with arsenous acid, forming colorless crystals, which are readily soluble in water, and have the formula,  $\text{NaAsO}_3 \cdot \text{C}_4\text{H}_4\text{O}_6 + 2\frac{1}{2}\text{H}_2\text{O}$  (=24.5 per cent. arsenic).—Pharm. Ztg., liii (1908), No. 35, 351.

*Arsenyl-Sodium Tartrate—Preparation.*—A. Gizelt has obtained a new arsenic compound, arsenyl-sodium tartrate;  $\text{Na}(\text{AsO}_3 \cdot \text{C}_4\text{H}_4\text{O}_6) + 2\frac{1}{2}\text{H}_2\text{O}$ , by saturating a boiling solution of sodium bitartrate with arsenic trioxide. It forms handsome crystals, which are soluble in water, and contain 24.41 per cent. of arsenic. The new compound has been demonstrated to be highly poisonous, but pharmacological experiments have not yet been advanced sufficiently to establish its therapeutic value.—Pharm. Ztg., liii (1908), No. 11, 110; from Therap. Monatsh., 1907, No. 12.

*Sodium Cacodylate—Alkalinity and Consequent Incompatibility of the Commercial Salt.*—Having to compound a prescription containing the cacodylate of sodium and iron, E. Barbano found that a precipitate of ferric hydroxide was formed on mixing the two salts. This was traced to the presence of free alkali in the sodium cacodylate, and further investigation showed that this salt as supplied in commerce is often far from neutral. When dispensing this salt, therefore, with other ingredients, the solution should, if necessary, first be neutralized with cacodylic acid.—Pharm. Journ., Aug. 21, 1907, 291; from Jour. de Phar. et Chim., 26 (1907), 116.

*Salicylic Acid—Detection of Free Phenol.*—O. Corletti recommends furfural for the detection of free phenol in salicylic acid, as follows: Triturate 0.25 Gm. of the acid with 5 Cc. of water, add 2 drops of a 2 per cent. alcoholic solution of furfural, mix gently, and allow 2 or 3 Cc. of concentrated sulphuric acid to flow slowly into the mixture along the walls of the test tube. In the presence of mere traces of phenol (0.00005 Gm.) the



two layers of liquids so produced develop a yellow color, afterwards deep blue, at the zone of contact. The method is equally available for the detection of phenol in salicylates.—Schweiz. Wschr. f. Chem. u. Pharm., xlv (1907), No. 45, 702; from Boll. Chim. Farm., 1907, No. 11, 421.

*Salicylic Acid Phenylhydrazone—Preparation and Characters.*—H. Schrötter and J. Flooh have prepared the phenylhydrazone of salicylic acid by heating in a boiling water-bath for 6 to 7 hours, under a reflux condenser, a mixture of 1 mol. of salicylic acid methyl ester and 2 mol. of phenylhydrazine, to which a few drops of piperidine are added. The condensation product was recrystallized from water or diluted alcohol and dried in a vacuum. So obtained, it forms white, shining laminæ, melting at 130° C., which are almost insoluble in cold water, but readily soluble in boiling water, ether, alcohol, chloroform, etc., and dissolve in alcohol with formation of salts. Its aqueous solution does not give a color reaction with ferric chloride at the ordinary temperature; but on prolonged standing, or more rapidly when heated, a violet coloration is noticed. The compound gives evidence of strong reducing properties towards ammoniacal silver solution, platinum chloride and Fehling's solution.—Pharm. Ztg., lii (1907), No. 89, 933; from Monatsh. f. Chem., 28 (1907), No. 7.

Referring to the above observations of Schrötter and Flooh, H. Meyer states that the compound is not, as believed by them, the phenylhydrazone of salicylic acid, but a "hydrazid of salicylic acid," which was first obtained by Cohn from salol and phenylhydrazine, and afterwards by himself (Meyer) from gaultheria oil, free phenylhydrazine and its hydrochloride.—Pharm. Ztg., lii (1907), No. 98, 1021; from Chem. Ztg., 1907, No. 89.

*Bismuth Subsalicylate—More Liberal U. S. P. Limit of Free Acid.*—Basing his judgment on the results of an examination of six samples of bismuth subsalicylate, Otto B. May expresses the opinion that a more liberal allowance must be made in future revisions of the U. S. P. for free (uncombined) acid, and he suggests the following to replace paragraph 6, p. 77, of the present Pharmacopœia:

"If 1 gramme of the salt be agitated with 10 Cc. of ether, and the liquid filtered through a double filter of fine texture, wetted with ether, the filtrate, when evaporated to dryness, should not leave more than 0.004 gramme of residue consisting of salicylic acid."—Amer. Journ. Pharm., May, 1908, 210.

*Salophen and Salacetol—Luminosity in the Dark on Trituration.*—N. van Eck has observed that if powdered salophen or salacetol are triturated gently in the dark, luminous rays are developed which, in the case of salophen, are sufficiently intense to produce a distinct effect on the photographic plate. The immediate cause of this luminosity has not yet been determined. In the case of other salicylic acid derivatives, such as

salicin, salipyrin, salinaphthol and aspirin, and in pure salicylic acid itself, no luminosity was manifested when similarly treated.—Pharm. Centralh., xlviii (1907), No. 30, 615-617.

*Tannin—Colorimetric Estimation in White Wines.*—M. Koebner recommends the following convenient and reliable method for the estimation of tannin in white wines: To 10 Cc. of the wine in a mixing cylinder add consecutively 10 Cc. of tartaric acid solution (1:10), 3 drops of ferric chloride solution (1:10), an excess of ammonia, and sufficient water to make 55 Cc. A clear liquid is thus obtained, with a color intensity dependent on the quantity of tannin in the wine, which is then estimated by colorimetric comparison with solutions prepared in the same manner with 1, 2, 3 or more Cc. of a standard tannin solution. The latter is obtained by dissolving 1 Gm. of tannin (dried at 100° C.) in 50 Gm. of conc. hydrochloric acid and sufficient water to make 1000 Cc. If, for example, the color intensity of the sample coincides with that of the solution prepared with 3 Cc. of the standard tannin solution, 10 Cc. of the wine contains 3 Mgm. (= 0.03 per cent.) of tannin.—Pharm. Ztg., liii (1908), No. 11, 111; from Chem. Ztg., 1908, No. 7.

*Gallotannic Acid—Constitution.*—Stewart J. Lloyd, having for some time been engaged in investigating the structure of gallotannic acid, has obtained results which, though his investigations are not yet completed, he considers sufficiently definite to justify publication. He has determined the molecular weight of certain crystalline derivatives of gallotannic acid, notably the pentacetyl derivative, and from these and various other experimental data concludes that natural gallotannic acid is composed essentially of three digallic groups united in a six-element ring. The structural formula given admits of an inactive *cis*-form as well as an active *trans*-form. There are several tannins from different plants resembling gallotannic acid very closely, so closely indeed that chemical identity has frequently been claimed for them. An investigation of these may result in definitely clearing up the question.—Chem. News, Mar. 20, 1908, 133.

*Bismuth Subgallate—Modification of U. S. P. Test for Free Acid.*—Otto B. May, in an examination of six samples of bismuth subgallate, found that not one of the samples strictly fulfils the requirements of the U. S. P. test for the "absence of free gallic acid." He regards the test of acidity by means of litmus, as required, to be supersensitive, and recommends the following in lieu of the one given in paragraph 5, p. 75 of the U. S. P., as being less strenuous and conformed to by all of our manufacturers:

"If 1 gramme of the salt be shaken with 10 Cc. of ether and filtered through a double filter, wetted with ether, the filtrate evaporated to dryness should not leave a weighable residue, nor should an immediate blue-black coloration appear after the addition of 2 drops of ferric chloride

—T. S."—Amer. Journ Pharm., May, 1908, 208-209.

*Ellagic Acid—Presence in Raspberries.*—Kunz-Krause and Schweissinger have determined the spontaneous turbidity of raspberry syrup (which see under "Pharmacy") to be due to the separation of ellagic acid, which has not heretofore been noticed as a constituent of raspberries.—Pharm. Ztg., lii (1907), No. 75, 786.

## ORGANIC BASES.

*New Volatile Alkaloids—Isolation from a Number of Plants.*—Pictet and Court have succeeded in isolating a number of new volatile alkaloids from tobacco, carrots, pepper, parsley and coca, by the following method: The dried material was digested in cold dilute solution of soda for some time, then subjected to distillation in a current of steam, the distillate neutralized with hydrochloric acid, evaporated to dryness, and the alkaloidal hydrochlorides separated from ammonium chloride by means of absolute alcohol.

*Tobacco* thus yielded two new alkaloids, which, separated as gold salts, were identified as pyrrolidine ( $C_4H_9N$ ) and n-methylpyrroline ( $C_5H_9O$ ).

*Carrot Leaves* also yielded two volatile alkaloids, one of them proving to be pyrrolidine, the other, although resembling nicotine in some respects, exhibited distinctions in others, and was named "daucine."

*Pepper (Piper niger)* yielded beside the well-known piperine, small quantities of a volatile alkaloid, of the composition  $C_5H_9O$ , and very probably represents c-methylpyrroline.

*Parsley Seeds* and *Coca Leaves*, as well as *Carrot Seeds*, yielded volatile bases in quantities too small, in each case, to serve the purpose of identification.—Pharm. Ztg., lii (1907), No. 72, 748.

*Alkaloidal Nomenclature—A Plea for Uniformity.*—Dr. Gordon Sharp says that some years ago it was the custom in Great Britain to make all alkaloids and their derivatives end in "*ine*," while glucosides, resins and principles not alkaloids, were made to end in "*in*." Now all is hopelessly mixed up. If the Germans send over a new derivative of an old alkaloid, editors, chemists, physiologists, pharmacologists, not to speak of the down-trodden clinician, seem to think that it should be written as our Teuton friends think. Thus you may read in the same sentence *eucaïne* and *cocain*, *heroin* and *dionine*; and the more or less pure ergot alkaloids are written, *cornutin*—Keller, and *cornutine*—Kobert; *secalintoxin* and *ergotoxine*, etc., etc. It would be much simpler if the old rule was adhered to so that when one comes across a new name, its alkaloidal nature would be revealed by the ending "*ine*."—Pharm. Journ., Aug. 10, 1907, 233.

*Alkaloidal Chemistry—Progress during 1906.*—Prof. H. M. Gordin continues his very interesting papers on the progress in alkaloidal chemistry during the year 1906, which may be consulted in the Pharm. Review, 1907, No. 7 (pp. 195–205), No. 8 (pp. 225–235), No. 9 (pp. 261–272),

No. 10 (pp. 313-316), No. 11 (pp. 340-345), and No. 12 (pp. 367-369), and 1908, No. 1 (pp. 1-18), No. 2 (pp. 33-43), No. 3 (pp. 76-87), and No. 4 (pp. 107-118).

*Alkaloidal Assay—A Simple General Method.*—M. H. Webster states that once the identity of a drug or its galenical preparation has been established the determination of at least its total alkaloids presents no more difficulties than that of a similar amount of metallic bases. It is generally conceded that the "shaking-out" process is pre-eminently adapted for separating the alkaloid in an approximately pure condition, suitable for its final volumetric estimation, which, with the aid of delicate indicators, makes it possible to determine the amount of free alkaloid within three-tenths of a milligram. The one, and a most serious, drawback to the "shaking-out" process with immiscible solvents is the tendency to emulsification, for the prevention of which various expedients are in use and have been proposed. For this purpose the principle of eliminating inert matter by first rejecting the alcohol-insoluble gums, proteids, etc., and then the water-insoluble fats, resins, etc., has been applied, though not always with uniform success. The author, however, accomplishes this by taking advantage of the solubility of the acid tartrates of the alkaloids in absolute alcohol, *in the presence of an excess of tartaric acid*, while ammonium acid tartrate remains undissolved under the same conditions, and is thus eliminated. On adding, therefore, a fluidextract to a large bulk of absolute alcohol containing a decided excess of tartaric acid, practically the whole of the  $\text{NH}_4$  will be precipitated along with nearly all the albuminous and gummy matter. The filtrate can be evaporated to a solid extract without injuring the alkaloids, which may be dissolved with acidified water, leaving behind the resin, chloroform and fat. From this acidified aqueous solution the alkaloids are then removed by the "shaking-out" process, using KOH and a mixture of 16 vol. chloroform and 4 vol. ether, after the well-known manner, without the annoyance of emulsification. The details of the method, which has been applied with advantage to a large number of official solid and fluidextracts, must be consulted in the original, in Amer. Journ. Pharm., July, 1907, 301-307.

*Alkaloidal Determinations—Chronological Review from 1806-1906.*—Dr. Otto Rammskedt has communicated a monograph of the quantitative methods for the determination of alkaloids, in which these are carefully reviewed in chronological order from the date of the discovery of morphine by Sertürner (1806) to practically the present day (1906). This interesting compilation, the result of the author's studies when engaged in his recently published work "On the Valuation of Narcotic Drugs and their Preparations" (Rudolstadt, 1907), must at least be mentioned here since it gives a clear and apparently complete survey of the field of accomplishment in the alkaloidal valuation of drugs. It may be consulted in

Apoth. Ztg., xxii (1907), Nos. 98, 99, 101 and 102, pp. 1067, 1079, 1103 and 1117.

*Alkaloid Estimation.*—A review of the literature on the estimation of alkaloids for the year 1906, is contributed by W. A. Puckner in the "Proceedings" of this Association, 1907, 383-400.

*Alkaloid Estimations—Recent Progress.*—W. A. Puckner reviews some of the advances made in recent years in the important field of alkaloid estimations. Divested of all analytical detail, this review covers the following subjects: Alkaloidal precipitants; the solubility of alkaloids in immiscible solvents and the hydrolysis of alkaloid salts; interference of ammonia, volatile bases and fats in the estimation of alkaloids; decomposition of chloroform by alkaloids; separation of strychnine from brucine; the assay of coca.—Amer. Journ. Pharm., Feb., 1908, 66-74.

*Alkaloid Determinations—Precaution when Shaking Out with Chloroform.*—The observation made by Panchaud in the course of the investigations of cinchona bark, that chloroform is liable to be decomposed by alkaloids held in solution, with formation of phosgen gas and hydrochloric acid, leads G. Fromme to suggest the advisability of evaporating the chloroformic solutions of alkaloids obtained by the shaking-out process immediately after their separation.—Pharm. Ztg., lii (1907), No. 74, 778.

*Alkaloid Determination in Leaves and Roots—Possible Errors from Presence of Saponaceous Compounds.*—G. Fromme has investigated the question whether in alkaloidal determination of leaf and root drugs by extraction with alkali and ether or chloroform, as in the case of oily seeds, the presence of fatty or resinous substance does not result in the formation of soap with the alkali, which taken up by the solvent, leads to errors in the subsequent titration. The results obtained are in the affirmative. If the residue of evaporation of such ethereal solutions is treated with hot water and this filtered with the aid of talc, and shaken out with petroleum ether so as to remove any free fat or resin retained in it, the aqueous filtrate will give all the reactions of soap, and to the extent of its presence must vitiate the titration if the determination of alkaloid is carried out in the usual manner. The titration method for the determination of alkaloids is therefore not adapted to any drug in which the alkaloid is associated with fat, chlorophyll or resinous bodies if absolutely accurate results are required. In such, the isolation and purification of the alkaloids by a suitable method, such as Keller's for instance, becomes necessary.—Pharm. Ztg., lii (1907), No. 74, 778.

*Alkaloids—Further Extension of the Picrolonic Acid Method of Determination.*—H. Matthes and O. Rammstedt have recently demonstrated the value of picrolonic acid as an aid in the determination of alkaloids (see Proceedings, 1907, 922), citing its successful use in the assay of the extracts of nux vomica and hydrastis, and of jaborandi leaves. The

authors have since extended their investigations to other alkaloids, and find that picrolonic acid is well adapted also for the quantitative determination of cotarnine, codeine and morphine.

*Cotarnine Picrolonate*,  $C_{12}H_{15}NO_4 \cdot C_{10}H_8N_4O_5$ , melts with conglobation and browning at  $205^\circ$ – $210^\circ$  C.

*Codeine Picrolonate*,  $C_{18}H_{21}NO_3 \cdot C_{10}H_8N_4O_5$ , melts at about  $225^\circ$  C., with decomposition.

*Morphine Picrolonate*,  $C_{17}H_{19}NO_3 \cdot C_{10}H_8N_4O_5$ , melts with conglobation, and darkening between  $200^\circ$  and  $210^\circ$  C.—Pharm. Ztg., lii (1907), No. 71, 740; from Ztschr. f. anal. Chem., 46 (1907), No. 9.

*Alkaloidal Picrolonates—Additional Description.*—H. Warren and S. Weiss also confirm the value of picrolonic acid (= dinitrophenylmethylpyrazolon) as a precipitant of alkaloids. Both authors extol the handsome crystalline form of the alkaloidal compounds obtained with it, and recommend the use of a saturated alcoholic solution of the reagent for this purpose, as a rule; although in particular cases, it may be more advantageous to use solutions in water, ether, benzol, chloroform, etc. The pure alkaloids may be very readily obtained from these picrolonates, by decomposing them with warm diluted sulphuric acid and shaking out the liberated picrolonic acid with acetic ether. To obtain the picrolonates in a pure crystalline condition, having a uniform composition, suitable for characterization, the precipitates from their aqueous solutions are best recrystallized from alcohol. Among the salts obtained, the authors describe the following:

*Coniine picrolonate*, crystallizes from alcohol in yellow rhombohedrons, readily soluble in ether or alcohol, and melting at  $195.5^\circ$  C. with decomposition.

*Nicotine Picrolonate*, crystallizes from alcohol in yellow, thin, prismatic needles, often in tufts, and melting at  $213^\circ$  C. and darkening.

*Strychnine picrolonate*, crystallizes from alcohol in rectangular prisms, frequently stellate (from water in crystalline laminæ), melting at about  $275^\circ$  C.

*Morphine Picrolonate* crystallizes in form of broad, flat needles, soluble in alcohol, and melting at  $186.5^\circ$  C.

*Codeine Picrolonate* forms deep-yellow, short, thick crystals; from hot alcohol in pyramids; m. p.,  $219^\circ$  C.

*Atropine Picrolonate*, short, pointed crystals, melting at  $194^\circ$  C.

*Quinine Picrolonate*, fine needles in tufts, melting at  $225^\circ$  C.

*Hydrastine Picrolonate*, long, yellow, flattened needles, melting at  $220^\circ$  C.—Pharm. Ztg., lii (1907), No. 89, 933; from Chem. Centralbl., 1907, ii, No. 16.

*Alkaloidal Double Salts with Ferric Chloride—Preparation and Characters.*—M. Scholtz has successfully prepared a series of double salts of

alkaloids and ferric chloride, which have heretofore not been described, probably on account of the ease with which they become dissociated during the evaporation of their solutions. They are readily obtained, however, if a solution of the hydrochloride of the alkaloid and of ferric chloride is treated with concentrated hydrochloric acid, which precipitates all of these double salts from their aqueous solutions, but redissolves them if an excess is added. The addition of acid must therefore be interrupted when the liquid becomes permanently turbid, whereupon the double salt will gradually deposit in handsome crystalline form. If necessary the salts may be recrystallized by dissolving them in a little water and again precipitating in the same way. The formation of the double salts is independent of the relative quantities of alkaloid hydrochloride and ferric salt, and is in molecular proportion, both in case of the mono- and the bin-acid salts. Their composition, therefore, corresponds to the general formulas  $A.HCl.FeCl_3$  or  $A.2HCl.FeCl_3$  ( $A$  = alkaloid). They usually have a constant melting-point, are readily soluble in water and alcohol, and precipitated by hydrochloric acid unchanged from aqueous solution. The most important double salts obtained are the following :

*Atropine Hydrochloride—Ferric Chloride* : Light yellow, tabular crystals, containing  $1H_2O$  ; m. p.,  $167^{\circ}$ – $168^{\circ}$  C.

*Quinine Hydrochloride—Ferric Chloride* : Tabular crystals ( $1H_2O$ ) ; m. p.,  $170^{\circ}$ – $171^{\circ}$  C.

*Cocaine Hydrochloride—Ferric Chloride* : Light yellow, needle-shaped, anhydrous crystals ; m. p.,  $165^{\circ}$ – $166^{\circ}$  C.

*Codeine Hydrochloride—Ferric Chloride* : Yellow-brown crystalline powder ( $2H_2O$ ) ; softens above  $80^{\circ}$  C. ; no definite melting-point.

*Caffeine Hydrochloride—Ferric Chloride* : Yellow, anhydrous, crystalline powder ; m. p.,  $77^{\circ}$  C.

*Strychnine Hydrochloride—Ferric Chloride* : Bright, red-brown, anhydrous, columnar crystals ; without constant melting-point.—Pharm. Ztg., liii (1908), No. 20, 200 ; from Ber. d. D. Pharm. Ges., 1908, No. 1.

*Aconine—Oxidation Products.*—In continuation of his studies of the oxidation products of aconine (see Proceedings, 1906, 922), Heinrich Schultze confirms the formula of the new base previously obtained by oxidation of aconine hydrochloride with chromic acid to be  $C_{24}H_{28}NO_8$ , and designates this base, provisionally, as *Oxidation Product I, a*. While aconine contains four methyl groups in the molecule, the new base, *I, a*, contains only three methyl groups, but retains the methylimide-group of aconine unchanged. The unsaturated nature of the oxidation-product *I, a* is demonstrated by the reducing action of its sulphate on permanganate, aconine exhibiting a saturated character under identical conditions. Furthermore, the author has succeeded in isolating from the

oxidation products of aconine the hydrochloride of a second new body, which he designates preliminarily as *Oxidation Product II, a*. This is characterized by possessing both basic and acid properties. The analysis of the barium salt of this new product, as also of its methylester, indicates that it must be regarded as a monocarbonic acid; and the further analysis shows that this new body, like the oxidation product *I, a*, contains three methyl groups and one methylimide group. The formula for the new product,  $C_{24}H_{38}NO_8$ , differs from that of the product *I, a* in the replacement of two atoms of hydrogen by one atom of oxygen, and leads to the inference that these products occupy the relation to each other of an acid to its complementary alcohol.—Arch. d. Pharm., 146 (1908), No. 4, 281-292.

*Aconitine—New Reaction.*—N. Monti describes the following new aconitine reaction: 2 to 4 drops of sulphuric acid (specific gravity 1.75) are mixed with 0.2 to 1.0 milligram of pure aconitine in a porcelain capsule, and heated on a boiling water-bath for five minutes. A little resorcin, about the same weight as that of the aconitine taken, is added to the mixture, and the heating is continued. The liquid becomes first reddish-yellow, and then red-violet, which in about twenty minutes acquires its greatest intensity. The coloration is very stable. Tried on a great number of other alkaloids, the reaction has given negative results, so that it appears to be characteristic of aconitine.—Pharm. Journ., May 9, 1908, 596; from Gaz. Chim. Ital., through Rec. Pharm., Febr., 1908, 50.

*Atropine—Synthesis and Yield.*—Although a synthesis of atropine by the condensation of tropine with tropic acid was effected by Ladenburg in 1883, no indication is given of the yield obtained. R. Wolfenstein and L. Mamtrock now give some practical details on this point. They find that the acid chloride of acetyl tropic acid condenses readily with tropine to form acetyl-atropine hydrochloride and that this substance on standing in aqueous solution loses its acetyl group and gives an 80 per cent. yield of atropine. The acid chloride of acetyl tropic acid employed in this condensation was prepared by acting on tropic acid at the ordinary temperature with an excess of acetyl chloride and then warming for a short time over a water-bath; the acetyl tropic acid thus obtained was an oil which after some days set to a white solid. In order to convert it into the acid chloride it was heated for an hour over a water-bath with thionyl chloride; after distilling off the excess of this reagent the resulting oily acid chloride was warmed for half an hour with tropine hydrochloride. Condensation at once set in with the evolution of hydrogen chloride. The conversion of this acetyl atropine hydrochloride into atropine was effected by dissolving it in warm water and allowing the solution to stand. On the addition of alkali the atropine was precipitated as an oil which, however, rapidly set to a white granular mass. The paper



also contains an account of the synthesis and properties of atropine analogues containing chlorine or bromine in place of the hydroxyl group. These substances also exert a mydriatic action on the pupil, but are more irritating than atropine.—Pharm. Journ., May 30, 1908, 736; from Ber. d. D. Chem. Ges., 41, (1908), 723-732.

*Atropinum Nitrosum* and *Cocainum Nitrosum* are new alkaloidal salts, which compose the active constituents of "Tucker's Asthma Remedy."

*Atropinum Nitrosum* forms white crystals, readily soluble in water and in alcohol, which have the composition  $C_{17}H_{23}NO_3HNO_2$ .

*Cocainum Nitrosum* forms faint-yellowish crystals, readily soluble in water, having the formula  $C_{17}H_{21}NO_4HNO_2$ . This salt, however, suffers decomposition in the dry state, losing acid and becoming partly insoluble. Hence it is supplied in form of concentrated aqueous solution.

*Einhorn's Solution*, which serves in place of Tucker's Remedy, may be prepared from these nitrites according to the following formula: Cocaine nitrite, 1.028; atropine nitrite, 0.581; glycerin, 32.16; distilled water, ad. 100.0. This solution is applied by the aid of an appropriate spray apparatus.—Pharm. Ztg., liii (1908), No. 35, 351; from E. Merck's Annual Rep. 1907.

*Scopolamine Hydrobromide—Preference of the Optically Inactive Variety.*—Although scopolamine hydrobromide occurs in commerce both in an optically active and inactive form, the G. P. gives no information concerning its optical activity. It is true that E. Schmidt had some years ago expressed the opinion that the differences in the optical activity of this base has no influence on its physiological action, and this opinion is confirmed by the recent investigations of H. Kionka. Nevertheless, the latter considers it desirable that the physical properties of scopolamine hydrobromide should be specified more accurately, the more particularly since Boehringer and Sons have succeeded in preparing three different scopolamines, differing from each other both in their optical relations and in their melting-points—two of them showing different optical activity, the third being optically inactive. Kionka gives preference to the optically *inactive* preparation, because it can be expected with some certainty that it is not subject to change; whereas all of the optically active scopolamines, particularly in their aqueous solution, lose their rotatory power more or less rapidly and also are changed in their melting-points. It is important, however, that the purity of this inactive scopolamine should be assured, and particularly that it should be free from "apatropine." In the presence of mere traces (1:20000) of this base, the addition of a drop of permanganate solution to dilute solution of scopolamine hydrobromide produces an immediate brown color, due to the reduction of the permanganate. This reaction is not interfered with by excessive quantities of scopolamine; it is quite as sensitive even in 40 per cent.

solutions as in the very dilute.—Pharm. Ztg., liii (1908), No. 5, 49-50; from Therap. d. Gegenw., 1908, No. 1.

*Cinchona Alkaloids*.—Order of Development in the Young Plants. See *Cinchona Seeds*, under "Materia Medica."

*Cinchona Alkaloids*.—*New Indicators to Replace Hematoxylin in Titration*.—Experience has shown that hematoxylin, which has been introduced into the G. P. solely as an indicator in the assay of cinchona alkaloids, is liable to prove unreliable in the presence of foreign extractive substances, such as may be looked for in preparations of cinchona bark. The presence of such, even in the smallest quantities, prevents a sharp and distinct change to violet, the indicator giving instead a more or less hazy greenish or grayish-blue color, which is slowly developed. E. Rupp and K. Seegers, in view of these deficiencies, have endeavored to find a more reliable indicator for the cinchona bases, and they have determined several phenolphthalein derivatives to be admirably suited for this purpose, namely, "dinitrophenolphthalein," for titrations of colorless or nearly colorless solutions (which may be substituted by "p-nitrophenol" with advantage), and "tetrachlortetrabromphenolphthalein," when the alkaloidal solutions are considerably colored. These indicators are used in form of 1 per cent. alcoholic solutions, 10-20 drops in the first case and about 20-30 drops in the second, the two nitro compounds in alkaline solution changing to yellow, the halogen phthalein to blue. Sufficient alcohol must be present in the titration mixture to prevent precipitation of alkaloid. The cinchona alkaloids deport themselves toward their indicator as mon-acid bases. The preparation of

*Tetrachlortetrabromphenolphthalein* is effected by heating 50 Gm. of tetrachlorphthalic acid with 80 Gm. of sulphuric acid and 50 Gm. of phenol at 180° C. for 6 hours, and pouring the cooled product into water. The tetrachlorphenolphthalein so formed and precipitated is collected on a suction-filter, dissolved in dilute soda solution, and again precipitated with acetic acid. The crude product is then bromated by dissolving 5 parts in 20 parts of alcohol and adding a solution of 10 Gm. of bromine in the same quantity of glacial acetic acid. On evaporating the solution on a water-bath, tetrachlortetrabromphenolphthalein is then deposited. In acid solution these several indicators are colorless, but sharply change to the indicated color in the presence of mere traces of alkali in excess.—Apoth. Ztg., xxii (1907), No. 71, 748-750.

*Quinine*.—*Advantage of Chloroform in Determinations by the Thalleioquin and Erythroquinine Reactions*.—According to J. Abensour, the determination of quinine by the *thalleioquin reaction* is best accomplished with the aid of chloroform, as follows: To about 10 Cc. of the liquid to be tested add, drop by drop, saturated bromine water until the fluorescence disappears. On now adding an equal volume of alcohol, to which

1-2 drops of ammonia have been added, a splendid green color is developed if quinine is present in sufficient quantity; but if the quantity of quinine is small, a little chloroform is added, in which the coloring matter dissolves and manifests itself by its intensity. Very small quantities of quinine are, however, better detected by the

*Erythroquinine Reaction.*—Add to 10 Cc. of the faintly acidulated aqueous liquid, 1 drop each of saturated bromine water, solution of potassium ferrocyanide (1 : 10) and ammonia water (10 per cent.), and shake the mixture with chloroform, which assumes a distinct red color in the presence of as little as 1 Mgm. in a liter of the liquid under examination. — Pharm. Ztg., lii (1907), No. 65, 680; from Journ. de Pharm. et Chim., 1907, xxvi, No. 1.

*Cinchonine—Formation of a New Base by the Action of Nitric Acid.*—Paul Rabe and Ernest Ackermann, by heating cinchonine,  $C_{19}H_{20}ON_2$ , free from cinchotine, with nitric acid of specific gravity, 1.3, for forty-eight hours, at 100° to 110° C., have obtained a base of the formula,  $C_{19}H_{20}O_6N_4$ ; this substance crystallizes from alcohol in colorless woolly needles, and melts with decomposition at about 238° C.; it yields a hydrochloride of the formula,  $C_{19}H_{20}O_6N_4 \cdot 2HCl$ , and on oxidation with chromic acid is converted into cinchonic acid.—Pharm. Journ., Aug. 3, 1907, 185; from Ber. d. D. Chem. Ges., 40 (1907), 2016.

*Quinine and Cinchonine Persulphates—Preparations and Properties.*—R. Wolfenstein and A. Wolff have obtained and describe acid and neutral quinine and cinchonine persulphates. *Acid quinine persulphate*,  $C_{20}H_{24}N_2O_{11} \cdot H_2S_2O_8$ , is obtained by the action of a solution of quinine sulphate in dilute sulphuric acid on dilute potassium persulphate solution. After standing for two days the mixture acquires a reddish color, and quinine acid persulphate separates out in handsome yellowish-white prismatic crystals. *Neutral quinine persulphate* ( $C_{20}H_{24}N_2O_{11}$ ),  $H_2S_2O_8$ , is obtained in a similar manner with aqueous solution of quinine hydrochloride and excess of ammonium persulphate; it forms crystalline needles. *Acid cinchonine persulphate*,  $C_{19}H_{22}N_2O_{11} \cdot H_2S_2O_8 + \frac{1}{2}H_2O$ , is obtained in silky needles by the interaction of ammonium persulphate and cinchonine sulphate in solution in dilute sulphuric acid. In neutral aqueous solution cinchonine sulphate and ammonium persulphate form *neutral cinchonine persulphate* ( $C_{19}H_{22}N_2O_{11}$ ),  $H_2S_2O_8$ , in long, almost colorless prismatic needles.—Pharm. Journ., April 11, 1908, 486; from Ber. d. D. Chem. Ges., 41 (1908), 717.

*Quinine Bisulphate—Direct Application of Kerner's and of Liebig-Hesse's Test.*—P. Bignelli observes that to apply *Kerner's Test* to quinine bisulphate, the exact equivalent of 2.162 Gm. of anhydrous bisulphate is weighed off, and intimately mixed in a mortar with 1.5 Gm. of lead carbonate. The mixture is then rubbed down for at least ten minutes with 5 to 10 Cc. of distilled water. The whole is then transferred to a small

flask, and the rest of the water, to make the final volume used exactly 20 Cc., is employed to wash out the mortar. The test is then proceeded with in the usual manner. The lead carbonate employed unites with one molecule of sulphuric acid, the quinine being converted thereby into ordinary sulphate. To apply the

*Liebig-Hesse Test*, only half the above quantity of acid sulphate and lead carbonate are taken, but the same quantity of water. Attempts to convert quinine hydrochloride into neutral sulphate by means of mercurous sulphate or silver sulphate have failed to give satisfactory results. In the first case, double salts of metal and alkaloid are formed; and in the second case, the presence of silver sulphate affects the solubility of the alkaloid.

*The Kerner-Weller Test for Quinine Sulphate*, although apparently simple, requires minute attention to details, which are described by the author at length, to obtain concordant results, and, even then, does not always give exact figures. A specimen of quinine sulphate containing free quinine will be classed as one containing other cinchona bases. It should therefore be supplemented by an ash determination; the amount of ash found should not exceed 0.10 per cent. In a case where the test gives negative results, a definite weight of the salt should be extracted with petroleum ether, and the test applied both to the residue obtained on distilling off the solvent and to the extracted, insoluble salt. The solubility of the sample in a mixture of alcohol and chloroform should also be determined.—Pharm. Journ., April 4, 1908, 451; from Monit. Scient., 22 (1908), 175 and 185.

*Basic Quinine Tannate—Composition*.—A basic tannate of quinine containing 40–50 per cent. of quinine has been introduced on the market by Zimmer & Co., who assign to it the formula  $C_{20}H_{24}N_2O_8 \cdot 3C_{14}H_{10}O_8 + 10H_2O$ . This preparation therefore contains a much higher percentage of quinine than the tannate of the G. P. IV, which demands only 30–32 per cent. of quinine. It is a yellowish-white powder, and in all other respects resembles the official tannate, being nearly insoluble in water and free from sulphuric acid and hydrochloric acid.—Pharm. Ztg., liii (1908), No. 25, 252.

*Cocaine and Tropacocaine—Fluorescent Properties of their Hydrochlorides*.—C. Reichard calls attention to the marked fluorescence which he has frequently observed in the course of investigations concerning the reactions of cocaine, and which manifested itself particularly in certain well-formed single crystals of the hydrochloride of the alkaloid. Similar observations were also made with the granular crystals of the hydrochloride of tropacocaine. Following up these observations, the author has demonstrated that this fluorescent property of the hydrochlorides of the two closely related bases may serve well for their analytical determination, and

particularly for the forensic detection and identification of cocaine. In the case of this alkaloid the characteristic blue fluorescence is so pronounced that it manifests itself, under the conditions explained in the author's paper, even when cocaine is present only in mere traces, and places all of the reactions heretofore proposed completely in the shade. In looking for the cause of this fluorescence the author conjectured that, inasmuch as both cocaine and tropacocaine contain a benzoyl radical, this might be responsible for the manifestation, and subjecting pure crystallized benzoic acid to microscopic examination under the same conditions he found precisely the same change in color and manifestation of fluorescence as was observed in the case of the two alkaloids. There is little doubt, therefore, that the fluorescence of cocaine and tropacocaine is due wholly, or at least chiefly, to the presence of the benzoyl radical in them.—Pharm. Ztg., lii (1907), No. 67, 698-699.

*Cocaine Residues—A New Basic By-Product.*—C. Liebermann has examined 20 Gm. of a base which had been obtained in working up 30 kilos of the alkaloids which accompany crude cocaine. The ecgonine residues after shaking with benzene were saturated with ammonia, and then extracted with ether; the ether on evaporation yielded the base in the form of an oil which distilled almost completely at  $132^{\circ}$ – $137^{\circ}$  C. under 11.14 Mm. pressure. The oil was proved, by analysis and measurements of its physical constants, to be the ethyl ester of anhydroecgonine. It is improbable that this substance existed preformed in the plant, and it is more likely to have been produced by the esterification of anhydroecgonine, which is known to occur in the residues, during the treatment of the latter with alcohol and hydrochloric acid.—Pharm. Journ., Nov. 16, 1907, 641; from Ber. d. D. Ch. Ges., 40 (1907), 3602.

*Cocaine Hydrochloride—Effect of Sterilization on its Solutions.*—In a discussion concerning the effect of sterilization of cocaine solutions before the "Société de Pharmacie," Lesure stated that sterilization in an autoclave at  $110^{\circ}$ – $120^{\circ}$  C. has no deleterious effect on solutions of cocaine hydrochloride, provided that the glass vessels employed as containers are of good quality. Any decomposition which may occur is due, not to the heat, but to the presence of a trace of alkali derived from the glass. Any vessel which does not yield more alkali to 50 Cc. of water when thus treated, than is neutralized by 3 Cc. of  $\frac{N}{100}$  hydrochloric acid solution, may be safely used for the purpose. Dumesnil confirmed this statement, and noted that the same applied to morphine hydrochloride. Even with alkaline glass vessels any decomposition might be prevented by adding 1 drop of hydrochloric acid to every 250 Cc. of water employed in making the solutions; this trace of acid is unobjectionable and is sufficient to neutralize any alkalinity of the glass. Herissey attributed the divergent recorded opinions on the actions of heat to the loose application of the term "co-

caine." The free base cocaine is affected by heating, but its salts are not.—Pharm. Journ., May 9, 1908, 596; from Journ. de Pharm. et Chim., 27 (1908), 403.

*Ecgonine—Estimation in Crude Cocaine and Java Coca.*—In continuation of his researches on cocaine and its manufacture, Greshoff finds that the ecgonine determinations in crude cocaine and in Java coca leaves are of practical importance, since part of the cocaine of commerce is produced from ecgonine derived from the bases associated with cocaine in the drug. Indeed, such determinations are of paramount importance, if, as in the case of the manipulation of Java coca, the total alkaloids are preliminarily split up into ecgonine, from which then cocaine is prepared synthetically by known methods. Greshoff finds, however, that ecgonine cannot be split off and determined directly in the drug, but that the total alkaloids must first be isolated by the method recommended by him several years ago (see Proceedings, 1905, 652). These are then boiled for one hour under a reflux condenser with thirty times their volume (weight? Rep.) of diluted hydrochloric acid and the same volume of water, filtering the liquid after cooling, washing the flask and filter with a little water, and shaking out filtrate and washings twice with an equal volume of ether. The ether-solution is distilled and evaporated to dryness on a water-bath, dried to constant weight by exposing it one hour at 90°–95° C. in the exsiccator, and weighed. The weight so ascertained represents the amount of anhydrous ecgonine obtainable from the coca leaves under examination.—Pharm. Ztg., lii (1907), No. 71, 740; from Pharm. Weekbl., 1907, No. 32.

*Morphine—Solubility in Ether.*—Although the statements concerning the solubility of morphine in ether vary considerably, it is in most cases assumed to be practically insoluble. This appears also to be the experience of Marchionneschi who found the solubilities at 5.5° C., to be as follows: Crystallized morphine in 1000 p. of ordinary ether, 0.049 p.; in anhydrous ether, 0.263 p.; anhydrous morphine in anhydrous ether, 0.56 p.—Pharm. Ztg., lii (1907), No. 72, 747; from Boll. Chim. Farm., 1907, No. 10.

*Morphine—Determination in the Stomach and Intestinal Contents.*—Edlefsen finds that the test for morphine depending on the reduction of iodic acid by salts of morphine is decidedly improved if some malachite green is added to the reagent. He uses a 0.5 per cent. aqueous solution of iodic acid, to which a green color of moderate intensity is communicated by the malachite green. The filtrate from the stomach-content is digested for a short time on a water-bath with an equal volume of a mixture of equal parts of 4 per cent. solution of tartaric acid and alcohol, then filtered and the filtrate evaporated to dryness. The residue is dissolved in a little water containing a drop of dilute hydrochloric acid, and a few

drops of the colorless solution so obtained are added to 5 Cc. of the reagent, which is then placed in hot water, whereupon, in a short time, the originally blue-green color is changed to lemon-yellow. If now ammonia is added to alkaline reaction, the pure yellow color of the mixture changes to brown or dark brown in the presence of morphine.—Pharm. Ztg., liii (1908), No. 29, 289; from Münch. Med. Wschr., 1908, No. 11.

*Morphine and Codeine—Hydrolytic Products of their Halogen Derivatives.*—Frederick Herbert Lees has shown that when morphine and codeine are respectively treated with phosphorus trichloride or phosphorus tribromide the secondary alcoholic hydroxyl grouping of the base is replaced by a chlorine or bromine atom, as the case may be, giving rise to

*Chloromorphide, Bromomorphide, Chlorocodeide and Bromocodeide* respectively. It has also been shown that the hydrolysis of these halogen derivatives of morphine and codeine by water does not regenerate the original bases, but furnishes instead in each case a mixture of at least two bases isomeric with the parent bases morphine and codeine, but sharply differentiated from them in melting point, specific rotatory power, and in a number of other properties. By the hydrolysis of chloromorphide ( $C_{17}H_{18}O_2NCl$ ) the author obtained

*Neo-Isomorphine* ( $C_{17}H_{19}O_3N$ ) and  $\beta$ -Isomorphine ( $C_{17}H_{19}O_3N$ ), while bromomorphide ( $C_{17}H_{18}O_2NBr$ ), when treated in the same way, yielded

$\beta$ -Isomorphine and Isomorphine ( $C_{17}H_{19}O_3N$ ). As was to be expected, chlorocodeide ( $C_{18}H_{20}O_2NCl$ ) and bromocodeide ( $C_{18}H_{20}O_2NBr$ ) being the analogues of chloromorphide and bromomorphide respectively, these methyl ethers of codeine also produce the corresponding isomerides of codeine, and

*Neo-Isocodeine* ( $C_{18}H_{21}O_3N$ ),  $\beta$ -Isocodeine ( $C_{18}H_{21}O_3N$ ), and Isocodeine ( $C_{18}H_{21}O_3N$ ), were thus obtained. These isomerides of codeine, moreover, have also been produced from the corresponding isomerides of morphine by methylation in the same manner as codeine is prepared from morphine.

Recently Knorr and his pupils at Jena have taken up the further investigation of the new isomerides of morphine and codeine obtained by the author, and his collaborators in respect to their relationship to each other and to the parent bases. From the preliminary results obtained it would seem as though these substances will prove of immense value in throwing some light on the still obscure problem of the constitution of the opium alkaloids, morphine, codeine, and thebaine.—Chem. & Drugg., July 20, 1907, 94; from Proc. Chem. Soc., 23 (1907), 200.

*$\alpha$ -Chloromorphide—Products of Hydrolysis.*—The hydrolysis of  $\alpha$ -chloromorphide, carried out by Alfred Oppé in a manner similar to the one described by Knorr and Hörlein for  $\alpha$ - and  $\beta$ -chlorocodide (which see), also yielded a mixture of three substances, namely,  $\alpha$ - and  $\beta$ -isomorphine, and

a third isomer,  $\gamma$ -isomorphine, which is identical with the "neoisomorphine" (see under "Morphine and Codeine"), recently described by Lees.—Pharm. Journ., May 30, 1908, 736; from Ber. d. D. Chem. Ges., 41 (1908), 975-981.

*$\alpha$ - and  $\beta$ -Chlorocodide—Products of their Hydrolysis.*—The investigations of Ludwig Knorr and Heinrich Hörlein demonstrate that the hydroxyl group in codeine or in morphine can readily be replaced by halogen by the action of phosphorus haloids or concentrated halogen acids. Similarly the halogen derivatives are easily converted back into the hydroxyl compounds, but the conversion is accompanied by an alteration in the configuration of the molecule, with the result that the original alkaloid codeine or morphine is not obtained, but instead of it a number of isomers are formed. A careful study of the products of the hydrolysis of the  $\alpha$ - and  $\beta$ -chlorocodide revealed the fact that both substances yield the same products, but in different proportions. Thus, while  $\alpha$ -chlorocodide gave 45 per cent. of pseudo-codeine, 15 per cent. of allo-pseudo-( $\beta$ -iso)-codeine, and 25 per cent. of isocodeine,  $\beta$ -chlorocodide gave the same products, but in the proportions of 10, 20, and 55 per cent. respectively. The hydrolysis of  $\alpha$ -chlorocodide was effected by boiling 106 Gm. of the substance for three hours with 500 Cc. of water and sufficient glacial acetic acid to keep it in solution; for the  $\beta$ -chlorocodide the method was similar, but the heating was continued for a very much longer time. The products of hydrolysis of the  $\alpha$ -chlorocodide were extracted from the alkaline solution by means of ether, and were then dissolved in five times their weight of 90 per cent. alcohol, and treated with the calculated amount of glacial acetic acid and potassium iodide. On standing, the hydriodides of the allopseudo- and pseudo-codeines separated out, while the isocodeine remained in the solution. The two former were separated by means of alcohol, while the isocodeine was purified by conversion into its acid oxalate, a substance which crystallizes very well from alcohol. In the case of the  $\beta$ -chlorocodide the mixed bases were separated by first precipitating the isocodeine as oxalate, and then separating the other two through their hydriodides, as above.—Pharm. Journ., May 30, 1908, 736; from Ber. d. D. Chem. Ges., 41 (1908), 969-975.

*Allopseudo-codeine—A New Isomer of Codeine.*—Two isomers of codeine—pseudo-codeine and isocodeine—have already been described, the latter by Schryver and Lees. Knorr, Hörlein and Grimme, however, find that the isocodeine of Schryver and Lees is a mixture of isocodeine with other substances, one of which has been found to be an optical isomer of pseudo-codeine, and is therefore called allopseudo-codeine. When oxidized this substance yields the same pseudocodeinone as pseudo-codeine itself does. Allopseudo-codeine was isolated from the mixture of substances described by Schryver and Lees as isocodeine by dissolving this mixture in water



containing acetic acid, and precipitating by means of potassium iodide; the mixture of hydriodides of pseudocodeine and allopseudocodeine so obtained can be separated into its constituents by means of alcohol, in which the hydriodide of allopseudocodeine is practically insoluble. Instead of converting these bases into their hydriodides, they may also be separated by acetylating the mixture and crystallizing from alcohol, when the acetyl derivative of allopseudocodeine separates out first. The new base is an oil which has a faint bluish-violet fluorescence, and has  $[a]_D^{25} = -228^\circ$  in alcoholic solution; when boiled with sodium hydroxide it is converted into 3-methylmorphimethin.—Pharm. Journ., Dec. 21, 1907, 817; from Ber. d. D. Chem. Ges., 40 (1907), 3844-3851.

*Apomorphine—Method of Preparing Stable Solutions.*—G. M. Pégurier has investigated the conditions which are necessary to produce stable solutions of apomorphine, and finds them in the complete exclusion of light and alkalinity. To insure absence of alkali (ammonia), the air of the laboratory is saturated with the vapor of acetic acid, by heating some of this in a porcelain vessel. The room is then darkened, and 0.5 Gm. of apomorphine is dissolved in 100 Cc. of distilled water by the aid of 1.5 Gm. of hydrochloric acid, filtered in the dark, and filled as full as possible into 1 Cc. vials of yellow glass, which are then sealed. Prepared in this way, it will keep for a long time, unchanged, if excluded from light.—Pharm. Ztg., lii (1907), No. 58, 605.

*Apomorphine—Alcohol as a Preservative of Its Solution.*—Referring to Pégurier's method of preparation of a stable apomorphine solution, described in the preceding abstract, which, apart from being troublesome and time-consuming, gives no guarantee of stability. A. Troutmann states that he has found no difficulty in preventing the oxidation of the apomorphine if alcohol is added to the solution. He has kept the solution unchanged for years by preparing it according to the following formula:

Apomorphine hydrochloride .....	1.0
Alcohol, 90 per cent.....	50.0
Dilute hydrochloric acid.....	10.0
Distilled water.....	ad. 200.0

The apomorphine is shaken in a *clean and dry* vial with the alcohol, the water is added, whereupon solution is effected almost instantaneously, and then the acid. It is now transferred into clean and dry vials of brown glass, which need not be sealed.—Pharm. Ztg., lii (1907), No. 61, 640.

*Heroin and Veratrine—Application of the "Lloyd Reaction."*—Dr. Daniel W. Fetterolf has made a series of comparative experiments with Lloyd's reaction as applied to heroine and veratrine. He finds that heroine yields with Lloyd's reaction results somewhat similar to morphine and

apomorphine, but the delicacy of the reaction is not as great as for the latter. A mixture of 0.01 Mgm. each of hydrastine and morphine yields a pale blue-violet color; a mixture of 0.001 Mgm. each of hydrastine and apomorphine, a pale red-violet at room temperature; but a mixture of 0.01 Mgm. each of hydrastine and heroine yields no coloration at room temperature, and not until heated to between 80° and 90° C., a very pale blue-violet color. As regards veratrine, the author believes it justifiable to conclude from his experiments that veratrine gives no characteristic response to the Lloyd reaction for alkaloids.—*Amer. Journ. Pharm.*, July, 1907, 317-325.

*Calumba Alkaloids—Empirical Formulas and Constitution.*—Dr. K. Feist, in response to the request of Prof. J. Gadamer, has made a comprehensive series of experiments with the object of definitely determining the empirical formulas and, if possible, the constitutional structure of the two alkaloids—columbamine and jateorrhizin—which the latter had determined in calumba root (which see under "Materia Medica"). He has been able to confirm the empirical formula  $C_{27}H_{33}NO_6I$ , given by Günzel for columbamine iodide, and has determined the composition of jateorrhizine iodide to correspond to the empirical formula  $C_{26}H_{32}NO_6I$ ; while the composition of the other salts of both bases proved on analyses to correspond with these formulas. Furthermore, it was determined that all the salts of these bases exhibit in their form, color and solubility a close resemblance to those of berberine (which is pointed out by Gadamer, is not a constituent of calumba root), but that the salts of jateorrhizine are, in general, more readily soluble than those of columbamine—the latter being present in the drug in somewhat larger quantity than jateorrhizine. Concerning the constitution of these bases, the author confirms the observation of Günzel that 4 methoxyl-groups are present in columbamine, and he has determined 3 methoxyl-groups in jateorrhizine. Moreover, the ethers obtained by the methylation of these bases—the columbamine-methyl-ether and the jateorrhizine-dimethyl-ether—proved among each other completely identical, so that columbamine may be designated as being the monomethyl ether of jateorrhizine. The methylated bases and their salts now also possess still greater resemblance with berberine than do the bases themselves. In fact, all the results of the numerous experiments made, point out that the calumba alkaloids, columbamine and jateorrhizine, contain the same nucleus as does berberine; but this can only be definitely confirmed by the splitting-up of the nucleus by oxidation, and while the results so far obtained in this direction are encouraging, a definite conclusion can only be reached when the oxidation can be conducted with larger quantities of material. In the course of these investigations the author has also determined the presence of a third alkaloid, present in very small relative quantity, which, although having still greater resemblance to berberine than the two other

calumba alkaloids, is nevertheless distinct from all of them, and has therefore been named

*Palmatine*.—It even gives the acetone reaction (formation of a crystalline compound with acetone), which has been regarded as being characteristic for berberine, as well as some other reactions which Gordin has employed for the detection of the latter. On the other hand, it has a close resemblance to methyl-columbamine, resp. dimethyl-jateorrhizine. Analysis of palmatine iodide, however, led to the formula:  $C_{21}H_{27}NO_6 \cdot I$ , and the methoxyl determination definitely proved the presence of 4 methoxyl groups, so that the constitution of palmatine iodide is explainable by the formula:  $C_{17}H_{19}NO_2(OCH_3)_4 \cdot I$ . The analogy of palmatine with berberine and its quaternary basic character are shown, furthermore, in that by reduction it is converted into a tertiary base—tetrahydro-palmatine—of the composition:  $C_{21}H_{29}NO_6$ . This closely resembles tetrahydro-methyl-columbamine, from which it deviates but slightly in its melting point. The author describes a number of the salts and derivatives of palmatine, which, in its free condition, crystallizes from alcohol in form of yellow needles, melting at  $238^{\circ}$ – $240^{\circ}$  C. with decomposition. Its precise relations to columbamine and jateorrhizine remain for future determination.—Arch. d. Pharm., 245 (1907), No. 8, 586–628.

*Emetine—New Reactions*.—B. Peroni describes a number of new reactions of emetine, which are noteworthy. The residue of evaporation of a solution of emetine gives on addition of a few drops of permanganate solution a violet coloration; with a solution of iodic acid in sulphuric acid, a red color, changing to violet, and later disappearing; with a sulphuric acid solution of sodium peroxide even the smallest traces of emetine produce a yellow-green color; with acid diphenylcarbazide an extremely sensitive rose color is produced. If emetine and a small crystal of silver nitrate are added to sulphuric acid a dark green color is developed, and if the mixture is then shaken with an excess of tungstic acid a blue mass results. With selenous acid, and similarly with selenic acid, in the presence of concentrated sulphuric acid, emetine gives a green color, which changes on addition of water to violet, and finally a rose color.—Pharm. Ztg., lii (1907), No. 54, 565; from Boll. Chim. Farm., 1907, 273.

*Ephedrine—Production from Pseudoephedrine*.—Several years ago (see Proceedings, 1905, 817) Ernst Schmidt announced that he succeeded in converting ephedrine ( $C_{10}H_{15}NO$ ) into its isomere pseudoephedrine by prolonged heating with hydrochloric acids of different strengths; but, although the pseudoephedrine proved to be identical with the original base, the complete conversion of all the ephedrine into pseudoephedrine could not be effected. This led to the inference that a condition of equilibrium manifests itself in the course of this process of conversion, and that therefore, reciprocally, pseudoephedrine might under the same con-

dition be converted into ephedrine. Experiments which are now described by the author in detail, prove the correctness of this assumption. As in the case of ephedrine, here also about one half of the original base remains unconverted, thus establishing the identity of the reversible reaction.—Arch. d. Pharm., 246 (1908), No. 3, 210-214.

*Gelsemine and Gelseminine*.—L. E. Sayre contributes a study on these two alkaloids in which he reviews the work done by previous investigators and gives the details of his own experiments in the attempt to separate them from the drug, in the "Proceedings" of this Association, 1907, 352-356.

*Hydrastine—Estimation in Fluidextract of Hydrastis*.—W. A. Puckner points out that the U. S. P., VIII, modification of his method for assaying fluidextract of hydrastis, which consists in using an aliquot portion for the assay, is a mistake, and demonstrates this by the results of comparative experiments, in which on the one hand the use of aliquot portions was avoided, while on the other the official method was strictly followed.—Pharm. Rev., May, 1908, 132-137.

*Hydro-Ergotinine Sulphate—Confirmation of Crystallinity*.—In a previous study of the alkaloids of ergot (see Proceedings, 1907, 756) Dr. F. Kraft described, besides the crystalline ergotinine discovered by Tanret, a second amorphous alkaloid, which is characterized by the ready solubility of its salts as a distinct individual, which, in view of its probable relation to ergotinine as a hydrate, he has named "hydro-ergotinine." About the same time, independently, Barger and Carr (Ibid., 928) observed the same base, to which they attributed different genetic relations, although they have since accepted the view of Kraft. Furthermore, they have made the important observation that their amorphous base, which they had named "ergotoxine," was capable of yielding crystalline salts, an observation which is now fully confirmed by the recent experiments of Kraft. He finds that if the gelatinous hydro-ergotinine sulphate obtained by the method described by him in his first paper is subjected to the action of a suction filter, spread upon a clay tile, and dried in a vacuum, a colorless, sandy powder is obtained, which readily dissolves in warm alcohol; concentrated solutions congeal on cooling to a gelatinous mass, but from dilute solutions it separates in crystals, forming handsome rhombic columns. The crystalline salt contains 7.18 per cent.  $\text{H}_2\text{SO}_4$ , the formula,  $(\text{C}_{25}\text{H}_{41}\text{O}_4\text{N}_3)_2\text{H}_2\text{SO}_4$ , requiring 7.24 per cent.  $\text{H}_2\text{SO}_4$ . Experiments made to obtain a crystalline ergotinine sulphate by this and other methods have failed of success.—Arch. d. Pharm., 245 (1907), No. 9, 644.

*Hydroxycaffeine—Preparation and Characters*.—According to E. Fischer, hydroxycaffeine, which is identical with 1,3,7-trimethyluric acid, is obtained by the action of alcoholic potash on caffeine chloride, and boiling the æthyloxycaffeine so produced with hydrochloric acid.

Hydroxycaffeine crystallizes from hot water in fine, felty needles, which melt and sublime at 345° C. It is readily soluble in hot water, and in acids, alkali carbonate and sodium benzoate, but difficultly soluble in alcohol, ether and chloroform. Pharmacological experiments made by E. Starkenstein, lead to the inference that it may prove a valuable therapeutic agent. In the form of a double salt,

*Hydroxycaffeine-Sodium Benzoate.* It has been found to be a very effective and absolutely non-toxic diuretic. It was employed in form of solution, obtained by dissolving 0.5 Gm. of hydroxycaffeine in 10 Cc. of a 5 per cent. solution of sodium benzoate.—Pharm. Ztg., lii (1907), No. 56, 585; from Arch. f. exper. Pathol. u. Pharm., 1907, 57, 1 and 2.

*Pseudotheobromine—Synthesis and Products of Oxidation.*—The results of a comprehensive investigation concerning the synthetic production of pseudotheobromine, by W. Schwabe, confirm in every particular those previously recorded by H. Pommerehne. They determine, that by the action of methylsulphate on xanthinesilver the same dimethylxanthine is formed, as results by the action of methyliodide. But they also demonstrate again the distinction of this product of reaction from its isomers—theobromine, theophylline and paraxanthine. In order to determine the position of the methyl group in the molecule of pseudotheobromine, this was subjected to oxidation with potassium dichromate and sulphuric acid. The products of oxidation proved to be the same as those obtained by the oxidation of theobromine, namely: carbon dioxide, methylparabanic acid, ammonia and methylbromine. It follows that, as in the case of theobromine and paraxanthine, it only contains a single methyl group in the urea-radical.—Arch. d. Pharm., 245 (1907), Nos. 5 and 6, 398–405.

*Theobromine-Sodium—Sodium Acetate ("Agurin")—Preparation.*—M. J. Schroeder gives the following method for obtaining the double compound of theobromine-sodium and sodium acetate, which has all the chemical and physical properties of the so-called "agurin." Dissolve 180 p. of theobromine in an alcohol solution of exactly 40 p. of sodium hydroxide (obtained by dissolving NaOH in an equal weight of water, diluting this solution with four times its weight of alcohol, and determining the exact NaOH content by titration). A solution of 136 p. of sodium acetate in twice its weight of water is then added to the theobromine-sodium solution and the mixture is evaporated to 302 p. The dry residue so obtained is then powdered.—Pharm. Ztg., lii (1908) No. 10, 98; from Pharm. Weekbl., 1907, No. 48.

*Methyldamascenine.*—A new *Nigella* alkaloid. See *Nigella Species* under "Materia Medica."

*Nierembergine.*—A poisonous alkaloid from *Nierembergia hippomanica*, which see under "Materia Medica."

*Pilocarpine—Pharmacologic Action.*—Experiments made by A. Zeri

show that pilocarpine administered in sufficient doses to cause profuse salivation and sweating, has no evident or constant effect on the biliary secretion. The determination of the dry residue of the bile secreted under the influence of jaborandi is misleading, since the slight increase observed is not due to any excitation of the hepatic cells, but to the concentration of the bodily secretions due to the dehydration of the system from the great increase of the amount of saliva as perspiration. As far as the actual volume of bile formed is concerned no increase is occasioned by pilocarpine, which is therefore not a cholagogue.—*Pharm. Journ.*, May 23, 1908, 696; from *Archiv. Farmacol. Speriment*, through *Nouv. Reméd.*, 24 (1908), 174.

*Pilocarpine Hydrochloride—Adulteration with Sulphonol.*—A. Langrand directs attention to an adulteration of pilocarpine hydrochloride with approximately 25 per cent. of sulphonol, occurring in the French market. It was characterized by its incomplete solubility in water. The adulterant was recognized by moistening a few crystals with strong sulphuric acid, by which the sulphonol crystals are blackened, whereas the pilocarpine crystals remain colorless or at most assume a greenish tint.—*Pharm. Ztg.*, ii (1907, No. 71, 740; from *Journ. de Pharm. et Chim.*, 26 (1907), No. 3.

*Strychnine—Elimination and Detection in Cases of Poisoning.*—G. Welborn describes and recommends a simplified and abbreviated method for the detection of strychnine, which he is confident, will be found to very considerably shorten the period heretofore necessary for the completion of the analysis. The paper cannot be profitably condensed and must be referred to in the original in *Pharm. Journ.*, Nov. 16, 1907, 639.

*Strychnine Cacodylate.*—Accurately-dosed hypodermic injection in combination with sodium glycerophosphate. See *Injections* under "Pharmacy."

*Yohimbine—Characteristic Reactions.*—C. Reichard describes a number of characteristic reactions of yohimbine among which the following is considered valuable for its forensic determination: If a drop of water is added to a mixture of yohimbine and potassium ferrocyanide, a bluish color manifests itself on the edge of the mixture, and, after drying, the edge has the appearance of a silvery-white ribbon with a bluish fluorescence, while the interior assumes a gold-colored fluorescence. These colorations disappear on the addition of hydrochloric acid; but if the residue is viewed obliquely, it appears to have a black-gray color.—*Pharm. Centralh.*, xlviii (1907), No. 37, 755-761.

*Benzidine—Variable Commercial Character.*—In 1904, O. and R. Adler had recognized in benzidine (= para-diamido-diphenyl,  $\text{NH}_2\text{C}_6\text{H}_4\text{C}_6\text{H}_4\text{NH}_2$ ) a very sensitive reagent for blood, with which it gives under the conditions of the test (addition of 2 Cc. of freshly-prepared alcoholic solution of benzidine to 8 Cc. of a solution of defibrinated blood

(1 : 200.00), followed by a few drops of acetic acid and 2 Cc. of 30 per cent. hydrogen dioxide) a distinct bluish-green color within two minutes. O. Schumm, in the course of experiments with this reagent, had found that the commercial substance varied considerably in its action, but in 1905 secured a benzidine which proved uniformly satisfactory. Since then he has examined the products of various manufacturers, in numerous samples, and found them to vary extraordinarily, not only as obtained from different manufacturers, but also as obtained from the same firm at different times. This variability is shown in a table, exhibiting the results obtained with 13 samples from one firm and 3 samples of benzidine from two others. The author calls attention to this variability in the hope that manufacturers will endeavor to supply a product of uniform activity. Such a product should give at least a faint bluish-green or light blue color in dilutions of blood of 1 : 100.000 to 200.000.—Pharm. Ztg., lii (1907), No. 58, 604.

*Trimethylamine—Convenient Preparation for Lecture Demonstration.*—

Dr. H. Haehn describes the following convenient method for preparing trimethylamine in quantities suitable and sufficient for demonstrating its properties: 3.3 Gm. of zinc wool, 16 Gm. amyl alcohol and 10 Gm. trimethylene bromide are heated over the small flame of a Bunsen burner, in a little flask resting on an asbestos plate, and super-imposed by a reflux condenser from which a tube conducts the gaseous trimethylamine into a pneumatic trough. The evolution of gas begins in about 5 minutes and after 10 minutes the trimethylamine may be collected in bell jars, in about 7 minutes a jar of 130 Cc. capacity is filled with the gas—one hour being necessary only to complete the filling of five jars of the same capacity—a quantity sufficient for the experimental demonstration. So obtained, the trimethylamine contains only a little propylene as impurity, which, if necessary, may be removed in the manner recommended (Ber. d. D. Chem. Ges., 31, 3067) by Wolkow and B. N. Menschutkin.—Arch. d. Pharm., 245 (1907), No. 7, 518.

*Hexamethylene-Tetramine.*—The results of examination of some trade-named samples of this substance are communicated to this Association by Daniel Base, in "Proceedings," 1907, 469-472.

*Dimethylaminophenyl Arsinic Acid (Dimethyl Atoxyl)—Preparation and Characters.*—A. Michaelis finds that when dimethylaniline is heated with arsenic trichloride it is converted into dimethylaniline arsenous oxide of the formula  $(\text{CH}_3)_2\text{N.C}_6\text{H}_4.\text{AsO}$ , which may be oxidized by hydrogen peroxide in alkaline solution to dimethylaminophenyl arsinic acid  $(\text{CH}_3)_2\text{NC}_6\text{H}_4.\text{AsO}(\text{OH})_2$ . The latter substance, which may also be obtained by methylating atoxyl by means of dimethylsulphate, forms long, slender leaflets, which do not melt, but char, on heating.—Pharm. Journ., June 6, 1908, 760; from Ber. d. D. Chem. Ges., 41 (1908), 1514-1516.

*Quinophenol (8-Oxyquinoline)*—*New Compounds*.—C. T. Mörner has investigated a number of quinophenol derivatives, and among them describes the following compounds, about which heretofore little has been known :

*Neutral Quinophenol Sulphate* is a yellow crystalline powder, readily soluble in cold water, difficultly soluble in strong alcohol, somewhat more readily in dilute alcohol, but insoluble in ether, benzene or chloroform. Its solutions have a fine yellow color. The aqueous solution is neutral to congo-red, but a dilute solution reacts like an acid on phenolphthalein. When heated, by itself or in solution, this compound is dissociated, quinophenol being split off, and the residue contains a larger or smaller quantity of quinophenol sulphate beside the neutral salt. In consequence of this dissociation the water of crystallization can not be determined in this compound by drying, but the results of the quantitative determination of the quinophenol by a volumetric method, and of the sulphuric acid, point to 1 mol. of water of crystallization.

*Quinophenol-Magnesium* is obtained in form of a yellow, crystalline precipitate when quinophenol sulphate solution is treated with magnesium hydroxide, with magnesium carbonate, or with an alkaline solution of any convenient magnesium salt. The precipitate of quinophenol-magnesium, which has a composition conforming to the formula  $(C_8H_6NO)_2Mg + 4H_2O$ , is associated with about 6.3 per cent. Mg. This compound seems to be useful for the quantitative determination of quinophenol, a question which the author proposes to submit to further investigation, together with a more accurate determination of the formula.—Pharm. Ztg., lii (1907), No. 58, 605-606; from Svensk. farm. tidskrift, 1907, No. 7-10.

*Pyridine—Reactions*.—Julius Schenkel finds that when pyridine is subjected to the action of sodium bisulphite very labile derivatives are formed, which appear to be sulphurous acid esters. These are soluble in water and are not volatile in steam. They are characterized by the ease with which they are attacked by alkalis, which split off all the nitrogen in the form of ammonia in the cold. The authors have not yet completed the investigation of the action of bisulphite solutions on the homologues and isomers of the pyridine series. If a mixture of different homologues and isomers of pyridine bases is treated with excess of bisulphite solution, the product consists of soluble addition-products and of insoluble or difficultly soluble pyridine bases; it may then be treated with water vapor, ether, or benzene, to separate the original mixture into two different parts.—Chem. News, June 26, 1908, 312; from Ber. d. D. Chem. Ges., 41 (1908), No. 7.

*Aniline Dyes—Non-Toxic Kinds*.—G. M. Meyer has given the following commercial aniline dyes to dogs in varying amounts and for fairly long periods without producing any marked toxic effect: Curcumin S, tartrazin



naphthol red S, carmoisin B, naphthol yellow S, orange gold, and ponceau 2 R. No lesions were shown in any case by post-mortem examination. There was one fatal result, a dog under treatment with ponceau 2 R dying, but another dog treated with similar and even larger doses showed no untoward symptoms, so that probably the dye was not the cause of death. All the dyes were excreted, in part unchanged with the fæces, and to some extent in the urine. They were found in the bile, but not in the milk. In some cases looseness of the bowels was noted, but as these commercial dyes are, in some instances, reduced with sodium sulphate, this effect might in some cases be due to the action of that salt.—Pharm. Journ., Sept. 7, 1907, 339; from Journ. Amer. Chem. Soc., 39 (1907), 892.

*Acetanilide—Expedition Determination.*—A. Seidell recommends a method for the rapid determination of acetanilide which depends on the method of Vaubel and Riedel for the determination of phenol and aniline in strongly acid solution as insoluble tribromide by means of potassium bromate. The bromate solution is best standardized so that 1 Cc. corresponds to 0.01 Gm of anilide. The hydrochloric acid used for the saponification of the anilide must at least have the strength of 1 p. HCl to 4 p. of water. For complete saponification heating on the steam-bath for one hour is required. The presence of caffeine, sodium bicarbonate, salol and sugar does not appreciably affect the results, but it is advisable to remove the water-soluble substance as much as possible, by treatment with a little water, before saponification. In the presence of phenacetin or antipyrine, on the other hand, the method is not available.—Journ. Amer. Chem. Soc., 29 (1907), 1091.

*Antipyrine—A very sensitive Reagent.*—According to F. A. Steensma, a very sensitive reagent for antipyrine is obtained by dissolving 1.0 Gm. of p-dimethylamidobenzaldehyde in 5 Cc. of 25 per cent. hydrochloric acid and sufficient absolute alcohol to make 100 Cc. If a trace of antipyrine is dissolved in several cubic centimeters of this reagent, and the solution is evaporated to dryness in a porcelain capsule, a light red spot remains as residue, or if less than 0.001 Mgm. is present a light red ring is formed on the porcelain. In case of exceedingly small quantities the reagent must be diluted with an equal volume of alcohol. Antipyrine in aqueous solutions must be extracted by shaking out with chloroform, which is evaporated after filtration.—Pharm. Ztg., lii (1907), No. 81, 851; from Pharm. Weekbl., 1907, No. 36.

#### GLUCOSIDES AND NEUTRAL PRINCIPLES.

*Glucosides—Systematic Classification.*—The first systematic classification of glucosides is that proposed by Hlasiwetz about 40 years ago, but this is inconsistent in the light of modern investigations and has become obso-

lete. It has nevertheless served as a nucleus for the classifications employed by van Rijn, by v. Lippmann, and Czapek, in their several works, none of which are however complete or satisfactory. L. Rosenthaler now proposes a systematic classification, which is based upon the character of the non-carbohydrate products of their hydrolysis—this being incontestably the most important constituent of the glucoside, whether employed in medicine and pharmacy, or for industrial purposes, such as tanning and dyeing. For the sake of brevity he calls these non-carbohydrate constituents "aglycones," and he divides the glucosides into groups based upon the chemical composition and relations of these aglycones, but without losing sight of the carbohydrates—such as dioses, trioses, tetroses, pentoses, etc., which serve for subsidiary divisions. In the following systematic grouping it is not the intention of the author, however, to give an exhaustive classification of all the known glucosides, and particularly not of the synthetic ones, his aim being to include the natural plant-glucosides as nearly complete as practicable. Omitting the complicated structural formulas, given in the original paper, the systematic classification of glucosides is as follows:

A. GLUCOSIDES WITH N-FREE AGLYCONES.

I. *Aliphatic Aglycones.*

1. *Alcohols.*

a. With monosaccharides.

α. With Pentoses: methyl-arabinside ( $\text{CH}_3\text{O} \cdot \text{C}_5\text{H}_9\text{O}_4$ ); ethyl-arabinside, ( $\text{C}_2\text{H}_5 \cdot \text{C}_5\text{H}_9\text{O}_4$ ).

β. With Methylpentoses: methyl-rhamnoside,  $\text{CH}_3\text{O} \cdot \text{C}_6\text{H}_{11}\text{O}_4$ ).

γ. With Hexoses: methyl-, ethyl-, propyl-, etc., compounds of glucose, for example,  $\text{CH}_3\text{O} \cdot \text{C}_6\text{H}_{11}\text{O}_5$ ; glycolglucoside, glyceringlucoside.

δ. With Heptoses: methyl-glycoheptoside, ( $\text{CH}_3\text{O} \cdot \text{C}_7\text{H}_{13}\text{O}_6$ ).

b. With Disaccharides.

a. With Hexose-methylpentosides: methylmannorhamnoside, ( $\text{CH}_3\text{O} \cdot \text{C}_{11}\text{H}_{21}\text{O}_9$ ) = hydrolytic product of strophanthin.

β. With Dihexosides: methyl-maltoside; methyl-lactoside, ( $\text{CH}_3\text{O} \cdot \text{C}_{12}\text{H}_{21}\text{O}_{10}$ ).

2. *Mercaptans.*

Arabinose-ethylmercaptal ( $\text{C}_2\text{H}_5\text{S} \cdot \text{C}_5\text{H}_{10}\text{O}_4$ ); galactose-ethylmercaptal, ( $\text{C}_2\text{H}_5\text{S} \cdot \text{C}_6\text{H}_{12}\text{O}_5$ ).

3. *Aldehydes.*

Chloralglucosides [chloraloses] ( $\text{CCl}_3\text{CH} \cdot \text{O} \cdot \text{C}_6\text{H}_{10}\text{O}_5$ ).

4. *Ketones.*

Acetoneglucoside [ $(\text{CH}_3)_2\text{C} \cdot \text{C}_6\text{H}_{10}\text{O}_5$ ].

5. *Acids.*

Glucosepentacetate [ $C_6H_7(C_2H_3O)_5O_6$ ] ; glucosido-glycolic acid,  $(COOH.CH_2.O.C_6H_{11}O_5)$  ; glucosido-lactic acid.

*Jalapin*,  $C_{40}H_{80}O_{23}$  (splits up into glucose, rhodose, methyl-ethylacetic acid and a oxyhexadecylic acid).

*Convolvulin* and other convolvulacea glucosides.

Supplemental : glycuronic compounds.

*Glycyrrhizinic Acid.*

II. *Hydrocyclic Aglycones.*

*Picrocrocin*,  $C_{38}H_{66}O_{17}$  (split up into terpene and glucose).

III. *Aromatic Aglycones.*

## o-Derivatives of benzol.

1. *Alcohols.*

Benzylarabioside,  $(C_6H_5CH_2.O.C_5H_9O_4)$ .

2. *Mercaptans.*

Glucose-benzyl-mercaptal,  $(C_6H_5.CH_2S)_2.C_6H_{11}O_5$ .

3. *Phenols.*

Phenolglucoside,  $(C_6H_5O.C_6H_{11}O_5)$  ; guaiacolglucoside.

*Arbutin* (hydroquinoneglucoside).

*Methylarbutin* (methylhydroquinoneglucoside).

Thymolglucoside ; phloroglucinglucoside.

4. *Phenolic Alcohols.*

*Salicin* (glucoside of salicylalcohol).

*Populin* (benzoyl-salicin).

5. *Phenol-Aldehydes.*

*Helicin* (salicylaldehyde glucoside).

*Salinigrin* (m-oxybenzaldehyde glucoside).

*Vanillin glucoside* (glucoside of methylprotocatechuglucoside).

6. *Phenolic Ketones.*

*Picein* (p-oxyacetophenone glucoside).

7. *Phenolic Acids.*

Salicylic acid glucoside.

*Glucogallin* (gallic acid glucoside ; tannic acid glucoside).

8. *Phenolic Acid-Esters.*

*Betulin* or *Gaultherin* (salicylic acid methylester glucoside).

*Phloridzin*,  $C_{31}H_{34}O_{10}$  (glucoside of phloretin or p-oxy-hydratopa acid phloroglucinerster).

*Glycyphyllin*,  $C_{21}H_{24}O_9$  (rhamnoside of phloretin).

*Iridin* (irigenin glucoside). May also be placed into group 6 (phenolic ketones), since "irigenin" contains ketone groups.

*oo-Derivatives of Styrol.*1. *Alcohols.*

*Coniferin* (glucoside of coniferyl-alcohol).

*Syringin* (glucoside of methoxyconiferyl-alcohol).

2. *Acids.*

*Tetrarin* ( $C_{22}H_{32}O_{12}$ ) splits up into cinnamic acid, rheosmin ( $C_{12}H_{10}O_2$ ) and glucose.

3. *Phenolic Acids and Lactones.*

*Scimmin* (probably the glucoside of umbelliferon or oxycumarin).

*Caffeotannic Acid* (glucoside of caffeic acid or dioxycinnamic acid).

*Daphnin* ( $C_{16}H_{16}O_9$ ) glucoside of daphnetin or 3, 4 dioxycumarin).

*Aesculin*,  $C_{15}H_{16}O_9$  (glucoside of aesculetin or 4, 5 dioxycumarin).

*Scopolin* ( $C_{24}H_{30}O_{15}$ ) and *Fabiana-Glycotannoid* are glucosides of a methylaesculin or (4) oxy-(5)-methoxycumarin.

*Fraxin*,  $C_{18}H_{18}O_{10}$  (glucoside of fraxetin or methoxydioxycumarin).

4. *Phenols and Esters.*

*Naringin*,  $C_{23}H_{36}O_{12}$  (rhamnoside of naringenin or *p*-cumaric acid phloroglucin ester).

*Hesperidin*,  $C_{30}H_{40}O_{27}$  (splits up into glucose, rhamnose and hesperidin, the phloroglucin ester of *m*-oxy-*p*-methoxycinnamic acid).

*ooo-Derivatives of Naphthalin.*

$\beta$ -Naphtholglucoside,  $C_{10}H_7O.C_6H_{11}O_5$ .

*oooo-Derivatives of Anthracene.*

*Rubierythrinic Acid*,  $C_{28}H_{38}O_{14}$ , disaccharide of alizarine or 1-2-dioxyanthraquinone).

*Rubiadingleucoside*,  $C_{21}H_{26}O_9$  (glucoside of 1, 3-dioxy-4-methylanthraquinone).

*Purpuringlucoside* (glucoside 1-, 2-, 4-trioxyanthraquinone).

*Chrysophanein* (glucoside of chrysophanic acid or of 5-, 8-dioxy-(1)-methylanthraquinone).

*Glucosides of emodin*, or 2-, 7-, 8-trioxy-(1)-methylanthraquinone).

*Frangulin*,  $C_{21}H_{26}O_9$  (rhamnoside of emodin).

*Morindin*,  $C_{28}H_{38}O_{16}$  (glucoside of morindon a trioxymethylanthraquinone).

*Barbaloin*,  $C_{21}H_{28}O_9$  (methylaldopentoside of a trioxymethylanthraquinone).

*Rheinglucoside* (glucoside of a tetroxymethylanthraquinone).

#### IV. Heterocyclic Aglycones.

##### *o*-Derivatives of Xanthone.

*Datisein*,  $C_{21}H_{24}O_{11}$  (rhamnoside datiscetin, a dioxydimethoxyxanthone).

##### *oo*-Derivatives of Flavone.

*Apiin*,  $C_{28}H_{32}O_{14}$  (glucoside of glucoapiose with 1-, 3-, 4'-trioxyflavone).

*Oxyapiinmethyl ether*,  $C_{27}H_{30}O_{13}$ .

*Fustin* (glucoside of fisetin, or 3-, 3'-, 4'-trioxyflavonol).

*Glucosides of Quercetin*, or 1-, 3-, 3'-, 4'-tetraoxyflavonol).

*Quercitrin*,  $C_{21}H_{22}O_{12}$  (quercetin-rhamnoside).

*Rutin*,  $C_{27}H_{30}O_{16}$  (quercetin-glucorhamnoside).

*Myricolorin*,  $C_{27}H_{28}O_{16}$  (quercetin-digalactoside)..

*Xanthorhamnin* (rhamnoside of a quercetin-methyl ether).

#### B. GLUCOSIDES WITH AGLYCONES CONTAINING NITROGEN.

##### *o*-Glucosides yielding HCN (*Nitrilglucosides*).

##### I. Aliphatic, HCN-free, Aglycones.

*Phaseolunatin* (acetone cyanhydringlucoside).

##### II. Aromatic, HCN-free, Aglycones.

*Amygdalic acid nitrilglucoside*; *Prulaurasin Sambunigrin*.

*Amygdalin*; *Isoamygdalin* (amygdalic acid nitrilmaltoside).

*Dhurrin* (p-oxyamygdalic acid nitrilglucoside).

##### III. Heterocyclic, HCN-free Aglycones.

*Lotusin* (lotosflavinester of maltose cyanhydrine).

##### *oo*-Glucosides not yielding HCN.

##### I. Aliphatic Aglycones.

*Ureaglucoside*; *amidoguanidinglucoside*; *Lecithinglucoside*.

##### II. Aromatic Aglycones.

*Anilineglucoside*,  $C_6H_5.N.C_6H_{12}O_6$ .

*Phenetidinglucoside*.

##### III. Heterocyclic Aglycones.

##### 1. Purine Derivative and Relatives.

*Caffeine- and theobromine-glucosides* (*cacaonine* *lolanine*); *vicin* and *convicin* (the latter a glucoside of *alloxantin*).

##### 2. Indol Derivatives.

*Indican*,  $C_{14}H_{17}NO_6$  (glucoside of *indoxyl*).

#### C. GLUCOSIDES WITH AGLYCONES CONTAINING NITROGEN AND SULPHUR.

##### *g*-Glucosides yielding *Isorhodan Derivatives*.

##### I. Aliphatic Aglycones.

*Sinigrin* (glucoside of the potassium salt of an ethero-

sulphuric acid, a derivative of an allyl-substituted iminoxythiocarbonic acid, and splitting up into allyl-mustard oil,  $\text{KHSO}_4$  and glucose.)

## II. Aromatic Aglycones.

*Gluconasturtiin* (splits up into phenyl-ethyl-mustard oil,  $\text{KHSO}_4$ , and glucose).

*Glucotropaeolin* (splits up into benzyl-mustard oil,  $\text{KHSO}_4$ , and glucose).

*Sinabin* (splits up into p-oxytoluyl-mustard oil, sinapine bisulphate and glucose).

## oo-Albuminoid Aglycones.

### *Glycoproteids?*

—Pharm. Centralh., xlviii (1907), No. 46, 949-955.

*Glucosides—Detection by Means of Emulsin.*—E. Bourquelot has devised a method for the detection of glucosides in plant substances which is based upon the observation that the enzyme *emulsin* is characterized by its power of hydrolyzing a large number of glucosides, all of which, as far as is known are lævorotatory, and yield dextrose as one of the products of hydrolysis. Hence the presence of such a glucoside may be determined by submitting the solution to the hydrolytic action of emulsin, just as cane sugar solution is submitted to the action of invertin. The emulsin used for this purpose is produced by carefully blanching 100 Gm. of sweet almonds after immersion for one minute in boiling water, powdering in a marble mortar, and mixing with 100 Cc. of saturated chloroform water, diluted with an equal volume of distilled water. The mixture is strained through a wetted cloth, and to 150-160 Cc. of the liquid 10 drops glacial acetic acid is added. On now filtering, about 120-130 Cc. of clear liquid should be obtained, which is added to 500 Cc. of 95 per cent. alcohol. The precipitate is collected, drained and washed with ether-alcohol. On drying, horny transparent scales are obtained, yielding a white powder. Emulsin thus prepared will keep for a long time in a dry, well-corked bottle. The application of the ferment is the same as that indicated for invertin. As, however, the emulsin often contains invertin, it is necessary to guard against errors that might be produced by the action of this on any cane sugar that may be present. This is effected by submitting the plant solution to the action of invertin before making the experiment with emulsin. In this way a large number of glucosides hydrolyzable by emulsin have been detected in various organs of plants belonging to widely different natural orders. As these glucosides are invariably present in the leaf, but are sometimes absent from the root, and as they disappear from the leaf prior to its fall, it follows that they cannot be waste products, but must be reserve materials.—Pharm. Journ., Dec. 21, 1907, 817; from Arch. d. Pharm., 245, 172.

*Rhamnosides—Researches on Several New Kinds.*—Several years ago (see Proceedings, 1904, 955) Dr. Ernst Schmidt reported the results of researches made with the collaboration of several of his students on certain rhamno-saccharides, namely: *rutin*, from *Ruta graveolens*; *sophorin*, from *Sophora japonica*; *Capparis-rutin*, from *Capparis spinosa*, and *robinin*, from *Robinia pseudacacia*. He has since investigated the rhamnosides of several other plants, with the assistance of A. Wunderlich, who reports upon the characters, methods of preparation, etc., of the following: *Viola-rutin* (*Viola-Quercitrin*), from *Viola-tricolor*; *Fagopyrum-rutin*, from *Fagopyrum esculentum* s. *Polygonum fagopyrum* (Buckwheat); and *Globularia-rutin*, from *Globularia alypum*.—Arch. d. Pharm., 246 (1908), No. 3 and 4, 214-259.

*Amygdalin—Character of Saccharine Derivative.*—L. Rosenthaler questions the correctness of the conclusions reached by E. Fischer from his work on amygdalin, that the saccharin derivative of this glucoside is maltose or a maltose-like body—a conclusion which appears to be generally accepted. Rosenthaler, to the contrary, believes to have proven that a maltose-like combination is absolutely excluded, and assumes the presence of a disaccharide in amygdalin, the precise chemical character of which remains to be determined.—Arch. d. Pharm., 245 (1907), No. 9, 684.

*Amygdalin—Hydrolysis by Emulsin.*—The studies of K. Feist demonstrate that amygdalin is split up under the action of emulsin into two molecules of glucose and one molecule of *d*-benzaldehydecyanhydrin. This by partial racemization is partially split into benzaldehyde and hydrocyanic acid, and completely so when benzaldehydecyanhydrin is distilled with steam. The commercial bitter almond oil is therefore inactive and fresh bitter almond oil contains free hydrocyanic acid, which then gradually again combines with the benzaldehyde. Pure *d*-benzaldehydecyanhydrin has therefore not been obtainable, and it is questionable whether it can be obtained at all.—Arch. d. Pharm., 246 (1908), No. 3, 206-209.

*Amygdonitril-Glucoside—A Natural Constituent of Cerasus Padus, Delarb.*—Although it has long been known that the vegetable organs, and particularly the bark of *Cerasus padus*, yield a distillate rich in hydrocyanic acid, the isolation of the pure principle yielding this acid has heretofore been unsuccessful, notwithstanding the endeavor of numerous experimenters. H. Hérissé has now, however, succeeded in isolating from the young, fresh twigs of this plant, a glucoside, which is proven to be identical with the "amygdonitril-glucoside," obtained by E. Fischer in 1895, by the action of yeast upon amygdalin (see Proceedings, 1896, 826). This result is the more noteworthy because it confirms the opinion originally advanced by Fischer that sooner or later amygdonitril-glucoside would be discovered as a natural constituent of plant substances.—Arch. d. Pharm., d. 245 (1907), No. 9, 941-944.

*Prulaurasin—Cyanogenetic Relations, Preparation and Characters.—*

After the discovery of amygdalin by Robiquet and Boutron-Charlard (1830) and the subsequent study of its composition and of the conditions under which it is split up into glucose, hydrocyanic acid and benzaldehyde, by Liebig and Wöhler (1837), it was generally assumed that the formation of these in the numerous other vegetable substances, under the same conditions, was due to the presence of the same glucoside, amygdalin; the more particularly, since amygdalin was obtained in a well-crystallized condition from the seeds of numerous *Rosaceæ* (cherries, plums, peaches etc.). In some cases, however, and particularly in the vegetable organs containing chlorophyll, the investigations resulted in the production of amorphous bodies, the chemical study of which has presented serious difficulties in determining the exact character of the cyanogenetic glucosides present in them. These difficulties are exemplified in the numerous investigations concerning the identity of the cyanogenetic body in the bark of *Prunus padus* and in the leaves of *Prunus lauracerusus*. The successful isolation of the cyanogenetic glucoside of cherry laurel leaves by H. Hérissé, in a pure crystallized condition, now lifts the veil which has so long obscured the identity of this body. He has named this glucoside "prulaurasin" and assigns to it the formula  $C_{14}H_{17}NO_6$ . By the action of emulsin it is split up in accordance with the equation:  $C_{14}H_{17}NO_6 + H_2O = C_6H_{12}O_6 + HCN + C_8H_{11}O_2$ . While in its ultimate composition it must be regarded as an isomeride of the "amygdonitril glucoside" of E. Fisher (see Proceedings, 1896, 826), and of the recently described "sambunigrin" of Bourquelot and Daujon, it is nevertheless not identical with either of these: differing from them in solubility, melting-point and optical rotation, which are intermediate between the two. The author gives the method of preparing prulaurasin in detail, but this can only be outlined here, as follows: 5000 Gm. of fresh cherry laurel leaves are immersed, in portions of 300 Gm. at a time, in 15 liters of boiling distilled water containing a little calcium carbonate, for 10 minutes, to destroy the emulsin. The leaves are then chopped fine and boiled for a short time in the same liquid. After cooling, this is expressed, clarified with albumen, and filtered—this resulting in 7.5–8 liters of filtrate, which is concentrated under diminished pressure to about 200 Cc., and mixed with four times its volume of 85 per cent. alcohol. After standing 24 hours, the voluminous precipitate is filtered off, the filtrate evaporated to dryness under diminished pressure, and the residue extracted with five portions each of 200 Cc. of boiling acetic ether, previously saturated with water. The united ethereal solutions are distilled to dryness, the residue is dissolved in 250 Cc. of water, shaken with a little calcium carbonate, filtered, shaken out five times successively with twice its volume of ether, and the aqueous solution evaporated to dryness at a low temperature and in the presence of cal-



cium carbonate. The residue is now extracted with *anhydrous* acetic ether, by boiling under a reflux condenser, which, upon evaporation under diminished pressure, yields nearly pure prulaurasin in a crystallizable condition. At this stage it is important that all solvents employed shall be perfectly pure and anhydrous. To obtain the glucoside perfectly pure and crystalline, it is redissolved in a mixture of anhydrous acetic ether and toluol (or chloroform), and to the cooled, semicrystalline mass, a little anhydrous ether is added, which accelerates the crystallization, so that it is completed within a few days. Fine needle-shaped crystals, occasionally several centimeters in length, are thus obtained. These are rapidly washed, first with a mixture of acetic ether and ether, then with ether alone, and finally dried in a vacuum over sulphuric acid. The ready solubility of prulaurasin presents the most serious difficulty in its preparation. It is very soluble in water, in alcohol and in acetic ether, but insoluble in ether; crystallizes in small prisms direct from its acetic ether solution, but in the form of fine needles under the conditions mentioned, and, so obtained, does not perceptibly lose weight on prolonged drying, and melts at  $120^{\circ}$ – $122^{\circ}$  C. It is colorless and odorless, and has a bitter taste.—Arch. d. Pharm., 245 (1907), No. 6, 463–468.

*Sambunigrin and Prulaurasin—Isomeric Relations.*—Em. Bourquelot and H. Hérissé contribute an interesting study of the isomeric relations of "sambunigrin," isolated by Bourquelot and Danjou from the leaves of *Sambucus nigra*, and of "prulaurasin," recently isolated by Hérissé from the leaves of *Prunus laurocerasus*, taking into consideration also their relation to other cyanogenetic glucosides, in particular the isomeric "amygdonitril glucoside," which E. Fischer had obtained by the action of yeast on amygdalin (see Proceedings, 1896, 826), and Hérissé had recently obtained as a natural constituent of *Cerasus padus*. The results of the investigation show that both sambunigrin and the glucoside of Fischer can be converted into prulaurasin. By treating the sambunigrin in the cold with very small quantities of barium hydroxide the conversion results very promptly, and the identity of the product with prulaurasin is demonstrated both by its optical rotation, and by the production of inactive phenylglycolic acid by the action of concentrated hydrochloric acid.—Arch. d. Pharm., 245 (1907), No. 6, 474–480.

*Isoamygdalin—Preparation, and Conversion into Prulaurasin.*—It having been demonstrated that amygdalin is converted by the action of a ferment into the amygdonitrilglycoside, H. Hérissé concluded that by the action of this ferment on isoamygdalin under the same conditions, this should be converted into prulaurasin, and the results of his investigations now recorded confirm this opinion. The isoamygdalin for this purpose was prepared from amygdalin by the method of Dakin, only slightly modified, which consists in subjecting the amygdalin to the action of an

aqueous  $\frac{2}{100}$  normal barium hydrate solution at a temperature of  $25^{\circ}\text{C}$ ., for about 12 hours (a period sufficing for its complete conversion into isoamygdalin), removing the barium by gaseous carbon dioxide, boiling the solution, filtering, and evaporating to dryness under reduced pressure. The residue was then purified by crystallization from 80 per cent. alcohol. The well-crystallized isoamygdalin so obtained can be dried to constant weight and, contrary to the statement of Caldwell and Courtland, is *not* hygroscopic. While the soluble ferments of the beer-yeast of the bakers, which is rich in invertin, are without action upon amygdalin, the same yeast is capable of yielding a ferment which acts upon amygdalin if it is treated as follows: The yeast is digested in 40 parts of distilled water for 5 or 6 hours; the yeast is separated, washed with water, and dried at  $33^{\circ}$ – $34^{\circ}\text{C}$ . The product may then be used either in form of an aqueous maceration or dry. Using 16 Gm. of amygdalin, this was converted into isoamygdalin as above described, and, after the removal of the barium carbonate by filtration, 12.5 Gm. of dried yeast (prepared as explained) and 3 Cc. of toluol were added to the filtrate. The mixture was then allowed to stand, two days at  $33^{\circ}\text{C}$ ., and 8 days more at  $19^{\circ}$ – $20^{\circ}\text{C}$ ., and stirred every day. Then, after adding a few grammes of calcium carbonate, it was mixed with an equal volume of 95 per cent. alcohol and distilled under diminished pressure to dryness, and the dry residue was purified by solution in hydrous acetic ether, and otherwise treated as described by the author for the preparation of *prulaurasin* (which see). So obtained, the colorless crystalline product proved to be identical in all its characters with the natural prulaurasin from cherry laurel leaves.—Arch. d. Pharm., 245 (1907), No. 8, 638–640.

*Arbutin—Optical Properties and Composition.*—In confirming the general proposition that all glucosides which are hydrolyzed by emulsin form dextrose and are themselves laevorotatory, E. Bourquelot and H. Hérissé have found that, among those which have been known for some time, arbutin was one of which the optical properties have not been definitely determined. The composition also does not appear to have been definitely settled. Schiff gave it the formula  $\text{C}_{12}\text{H}_{16}\text{O}_7$ ; Hlasiwetz and Habermann the more complex one of  $\text{C}_{25}\text{H}_{34}\text{O}_{14}$ , since they found methyl-hydroquinone among its hydrolysis products. But Schiff states that arbutin of commerce invariably contains methyl-arbutin. The authors, by the cryoscopic method, confirm the formula of Schiff. Commercial *arbutin* was found to have the  $a_D$   $-61^{\circ}.78$ ; when purified the  $a_D$  was  $-61^{\circ}.3$ . On drying it rose from  $64^{\circ}.7$  in one sample to  $65^{\circ}.04$  in another. *Methyl-arbutin* was found to have  $a_D$   $-63^{\circ}.42$ , and m. p.  $175^{\circ}$ – $176^{\circ}\text{C}$ .; *benzyl-arbutin*,  $a_D$   $-44^{\circ}.47$ , and m. p.  $161^{\circ}$ – $162^{\circ}\text{C}$ .; while the exact optical deviation of dinitro-arbutin could not be determined on account of the deep yellow color of its solutions, but it approached  $-74^{\circ}$  to  $-75^{\circ}$ . All

of these derivatives are hydrolyzed by emulsin, forming dextrose.—Pharm. Journ., May 30, 1908, 736; from Journ. de Pharm. et Chim., 27 (1908), 421.

*Aucubin*.—A constituent of different species of *Plantago*, which see under "Materia Medica."

*Beta-Barbaloin*.—A New Isomeride.—E. Léger stated at a recent meeting of the Paris Society of Pharmacy that when barbaloin is heated to 160°–165° C., it is isomerized into an amorphous form, *β*-barbaloin, which affords crystalline bromo- and chloro-compounds.—Pharm. Journ., Jan. 4, 1908, 9; from Compt. rend., 145 (1907), 1179.

*Frangula- and Aloe-Emodin Trimethylethers*.—Preparation and Characters.—O. A. Oesterle and Ed. Tisza, engaged in the study of the emodin ethers, have prepared and describe the products obtained by the methylation of frangula- and aloe-emodin. To prepare

*Frangula-Emodin Trimethylether*, a warmed solution of frangula-emodin in aqueous solution of potassium hydroxide is shaken with a little more than the calculated quantity of dimethyl sulphate, maintaining an alkaline reaction of the mixture until the originally deep-red color of the solution is reduced to a faint red. The flocculent yellow-brown precipitate is boiled with repeated portions of dilute KOH, until the latter runs off colorless. The washed trimethylether is then purified by crystallization from dilute acetic acid, with the aid of blood-charcoal. It is so obtained in long, hair-fine, felty, light-yellow needles, melting at 225° C.; crystallizes from alcohol in short, fine, concentrically arranged needles, from methyl alcohol in tufts of long needles, and from acetone in short needles. Readily soluble in glacial acetic acid, benzol, methyl alcohol, and hot alcohol; difficultly soluble in ether; insoluble in petroleum ether. It forms a cherry-red solution with conc. sulphuric acid; orange-red with conc. nitric acid. The analysis agrees with the formula  $C_{15}H_7O_4(OCH_3)_3$ .

*Aloe-Emodin Trimethylether* is obtained in a similar way, but it is difficult to methylate all the emodin completely. The product of the reaction, insoluble in hot dilute KOH, is purified by crystallization, with the aid of blood-charcoal, and is thus obtained in short needles; from alcohol or benzol in long needles, and from acetone in stout needles, of a red-yellow color. It melts at 163° C., is readily soluble in acetone, chloroform, benzol, glacial acetic acid, and pyridine, sparingly soluble in ether, alcohol, methyl alcohol, and acetic ether, and very difficultly soluble in petroleum ether. The colors of its solutions in conc. sulphuric and nitric acids are the same as those of the frangula-emodin ether. Analysis leads to the formula  $C_{15}H_7O_4(OCH_3)_3$ . The recently described isomeric compound of

*Morindon* (which see) appears to occupy an intermediate position between the two ethers here described. The further study of these ethers is in progress.—Arch. d. Pharm., 246 (1908), No. 2, 112–116.

*Bitter Principles of Calumba—Investigation.*—In the course of his researches concerning the composition and constitution of the calumba alkaloids (which see under "Organic Bases"), K. Feist experienced considerable difficulty in removing a body from the nitrate of one of the bases, columbamine, to which it adhered persistently during the crystallization from alcoholic and aqueous solutions. The separation was eventually accomplished by treating the impure crystals of columbamine nitrate with benzol, in which the alkaloidal salt is nearly insoluble, whereas the accompanying body is soluble. This body proved to be devoid of nitrogen, and possessing a pronounced bitter taste, is designated preliminarily as "bitter principle II." Two bitter principles, columbin and columbic acid, have heretofore been the only ones described as being derived from calumba root: the columbin being a colorless crystalline substance, while the columbic acid is described as being amorphous and yellow. For the purpose of comparison the author has prepared some columbin, and he obtained it after several recrystallizations from alcohol in form of colorless needles, which melted with frothing at  $182^{\circ}$  C. Hilger assigns to this the formula:  $C_{21}H_{34}O_7$ . The

*Bitter Principle II*, on the other hand, is nearly insoluble in most solvents. It forms compact crystals, which melt at  $246^{\circ}$  C., with sputtering. In order to further demonstrate the difference between these two bitter principles, the author, having determined the molecular value of columbin to conform to the formula of Hilger, endeavored to ascertain the molecular value of the "bitter principle II," for the purpose of comparison, but failed to accomplish this by any of the methods tried. In the course of this, it was shown however that both bitter principles can be titrated, and that both, although not acid in themselves, possess the characters of lactones. From columbic acid, the "bitter principle II" is differentiated by the yellow color and amorphous character of the columbic acid.—Arch. d. Pharm., 245 (1907), No. 8, 579-598 and 628-637.

*Cantharidin—Melting-Point.*—The variation in the melting-point of cantharidin given in the literature as  $205^{\circ}$  and  $210^{\circ}$  C., is accounted for by Kunz-Krause by the method of its preparation. When obtained (from India cantharides) by sublimation it proved to be at  $210^{\circ}$  C., while when obtained with solvents, it was found to be at  $205^{\circ}$  C. This difference also explains the occurrence of two crystalline forms—oblique prisms and rectangular needles.—Pharm. Ztg., lii (1907), No. 81, 851; from Chem. Ztg., 1907, No. 79.

*Cubebin—Formula and Constitution.*—The investigations of E. Mameli lead him to adopt the formula  $C_{20}H_{30}O_8$  for cubebin. He regards it as probable that the molecule contains two piperonyl nuclei, and also notes the presence of two alcoholic hydroxyls and of a group containing six

carbon atoms ( $C_6H_5$ ), which combines with the piperonyl nuclei and is found in the *p*-position towards the dioxymethylene group 1, 2-. The melting-point of pure cubebin is  $132^{\circ} C.$ ; its specific rotation  $45, 45^{\circ} C.$ —Pharm. Ztg., liii (1908), No. 11; from Chem. Ztg., 1908, No. 4.

*Active Digitalis Glucosides—Distinctive Reactions.*—According to L. Garnier, the following reactions are distinctive of the toxic glucosides of digitalis, digitoxin or crystalline digitalin, and amorphous digitalin. *Keller's reaction.*—The reagents used are (*a*) glacial acetic acid, 100 Cc., to which is added 5 Cc. of a 5 per cent. aqueous solution of ferric sulphate and (*b*) a similar mixture of sulphuric acid and ferric sulphate solution. A particle of the glucoside is dissolved in 1 or 2 Cc. of (*a*) in a narrow test-tube; 2 Cc. of (*b*) is then run down by means of a pipette, without mixing. At normal temperatures *digitoxin* slowly develops a blackish-blue color at the zone of contact; after two or three hours the supernatant acetic liquid is colored bright blue, turning to deep blue in five hours, the line of separation having become black. *Amorphous digitalin* gives in the lower sulphuric acid layer a cherry-red color at once. *Brissemoret-Derrien's reaction.*—The reagents are (*a*) glacial acetic acid, 30 Cc., to which is added 20 Cc. of an aqueous solution of oxalic acid, 4 per cent., which has been reduced to glyoxylic acid by treatment with sodium amalgam to neutrality; (*b*) strong sulphuric acid. The glucosides are dissolved in (*a*), and treated with (*b*) as above. They are not at all easily soluble in (*a*). When the reagents are floated, *digitoxin* gives at first, at the contact zone, a grayish or pale greenish color; in two hours this becomes bottle-green, after five hours the line of demarcation is dark, blackish, with a pale green border. *Amorphous digitalin*, under like conditions, gives the same cherry-red color that it affords with Keller's reaction. *Lafon's reaction* also requires two reagents (*a*) a mixture of equal volumes of sulphuric acid and of alcohol 95 per cent., well cooled, and (*b*) a very dilute, almost colorless solution of ferric chloride. A particle of the glucoside is moistened in a watch-glass with a drop of (*a*), with which it gives a yellowish color. A drop of (*b*) is placed in contact with this. At the point of junction of the drops, *digitoxin* rapidly gives a deep greenish-blue color, *amorphous digitalin* gives no reaction. This last reaction may be conveniently applied to the chloroform residue obtained in the course of a toxicological test. Keller's reaction is also available under these conditions, but the Brisse-moret-Derrien test cannot be applied directly on account of the insolubility of the glucosides in the aceto-glyoxylic acid reagent. To obtain distinct color reactions, it is necessary first to dissolve the chloroform residue in glacial acetic acid, and apply the reagents to the solution.—Pharm. Journ., May 9, 1908, 596; from Journ. de Pharm. et Chim., 27 (1908), 369.

*Digitalin and Digalen—Solubilities and Distinctions.*—Petit finds that.

when crystallized *digitalin* is dissolved in very little alcohol and the solution is then diluted with water, separation of digitalin crystals results even in dilutions of 1:10,000, and does not cease entirely until a dilution of 1:15,000 is reached. The solution then undergoes no further changes, and may be sterilized and preserved in sealed vials (ampuli). Injections of this solution, up to 3 Cc., are well tolerated. The inference was near that *digalen* (the so-called "digitoxin soluble") also contains alcohol, although it is described as being free from alcohol. As a matter of fact, the author found 10 per cent. of alcohol to be present in the solutions of digalen that are supplied. On the other hand, he was unable to determine the presence of digitalin. By extraction with chloroform, he obtained instead an amorphous body, insoluble in water, but soluble in alcohol, which failed to give the well-known green reaction with hydrochloric acid characteristic of digitalin, while its alcoholic solution was devoid of bitter taste.—Pharm. Ztg., lii (1907), No. 65, 680; from Rép. de Pharm., 1907, No. 7.

*Kolatin—Characters and Function in Seeds.*—According to Goris, the crystalline principle, "kolatin," which he has isolated from *fresh* kola nuts, is a phenolic body, having the composition  $C_8H_{10}O_4$ . It crystallizes in prismatic needles, and under certain conditions is oxidized, forming insoluble "kola-red." The caffeine of kola nuts is dissolved by kolatin in the same manner as by sodium benzoate or salicylate—the fresh nuts containing about 1.5 per cent. of such "kolatin-caffeine" combination (=6 to 7.5 per cent., calculated for the anhydrous nuts)—the two substances being in proportion. On drying the nuts, the kolatin disappears; consequently ordinary preparations of kola—tincture, wine, extracts, etc.—do not contain any kolatin.—Pharm. Ztg., lii (1907), No. 65, 680; from Bull. Commerc., 1907, No. 6.

*Kolatin—Preparation, Yield and Pharmacological Activity.*—According to A. Goris and J. Chevalier, kolatin (see *Kola nuts* under "Materia Medica") may be prepared from the fresh kola nuts by dividing them and introducing them, little by little, into boiling 95 per cent. alcohol, continuing the boiling for half an hour after the final addition. The seeds, which are now sterilized, are removed, powdered and exhausted by two successive quantities of fresh alcohol. The united filtered tinctures are evaporated *in vacuo* to a syrup, which is transferred to a separator and exhausted with chloroform. The syrup is then set aside to crystallize. The crystalline mass is filtered off by means of the pump, washed with very dilute alcohol, and dried *in vacuo* over sulphuric acid. It is then exhausted with boiling chloroform and the insoluble residue crystallized from alcohol. The substance thus obtained is probably an unstable combination of kolatin and caffeine; it is dissolved in warm water and exhausted with chloroform, which removes the caffeine from the dissociated

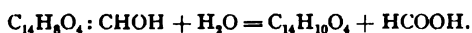
product. The yield is about 0.75 per cent. of the fresh seeds. Injected intravenously into warm-blooded animals it increases the energy of the cardiac contractions and slightly raises the blood-pressure. It is to a certain extent antagonistic to caffeine, both as regards the action on the muscles and on the central nervous system. Hence the powdered seeds, sterilized before they were dried, have a physiological action different from that of the dried seeds in which the kolatin no longer exists, it having been converted into kola-red.—Pharm. Journ., Jan. 11, 1908, 31; from Bull. des Sci. Pharm., 14 (1907), 645.

*Marrubiin* is the subject of a preliminary report by H. M. Gordin, in the "Proceedings" of this Association, 1907, 485-486.

*Pseudobaptisin—Hydrolytic Products and Derivatives.*—In his first paper on pseudobaptisin (see Proceedings, 1898, 1082), Dr. K. Gorter announced that he had succeeded in preparing a monoacetyl derivative from pseudobaptigenin ( $C_{16}H_{10}O_6$ ), the hydrolytic product of the glucoside. This result is now confirmed by his further researches on the nature of this glucosidal derivative, by the preparation of the monobenzoyl derivative of pseudobaptigenin, which was obtained in the form of small white needles, melting at  $216^{\circ}C.$ , and the monohydroxylated nature of

*Pseudobaptigenin* is thus definitely established. The author had, furthermore, studied the action of ethyl iodide on pseudobaptigenin-sodium, and had determined that no ethylpseudobaptigenin is produced by this reaction. His present investigations justify him in the definite conclusion that the product of the reaction is a new and distinct body, named by the author

*Pseudobaptigin*, which has the composition  $C_{14}H_{10}O_4$ , and results from the pseudobaptigenin, by splitting off formic acid, according to the following equation:  $C_{16}H_{10}O_6 + H_2O = C_{14}H_{10}O_4 + HCOOH$ . The melting-point of this new body, which was obtained in a perfectly pure state, is found to be  $172^{\circ}C.$  It has been proven that it does not contain a hydroxyl, for it was not possible to prepare either an acetyl or benzoyl derivative from it: a result which is highly important, since it shows that the hydroxyl group in pseudobaptigenin must be present as an oxymethylene group. The conversion into pseudobaptigin may therefore be illustrated by the following equation:



This also explains perfectly, that the oxymethylene group, with assimilation of water, is split off as formic acid, and that in consequence a hydroxyl-free body is formed when ethyl iodide and pseudobaptigenin-sodium react upon each other.

Pseudobaptigin is not resistant to the action of alcoholic potash; on boiling it with this alkali a molecule of formic acid splits off quantitatively

and is converted into a snow-white substance, crystallizing in flexible needles, melting at  $129^{\circ}$ – $129.5^{\circ}$  C., and forming in acetone solution an intense red color on addition of ferric chloride. These properties indicated that this compound was probably identical with that previously obtained by the author by the hydrolysis of pseudobaptigenin with alkali, and this was confirmed by the elementary analysis, which gives the formula  $C_{13}H_{12}O_4$ . The new compound is regarded as being *methylbaptigenetin*. It is true that the isolation of *baptigenetin* from this compound has not yet been successfully accomplished, but it has been proven that methyl iodide is split off on treating it with hydriodic acid by the method of Leisel, and from the products of the reaction methyl alcohol has been actually produced.—Arch. d. Pharm., 245 (1907), No. 8, 561–572.

*Ouabain and Strophanthin—Distinction of Botanical Source and Chemical Relation.*—With the object of clearing up the confusion existing in the conception of what constitutes the products designated respectively “ouabain” and “strophanthin” by different authors, Prof. Thoms reviews the history of the products which have been described under these names, and is led to the following conclusions: The ouabain of Lewin is derived from *Acocanthera Schimperii*. This *acocanthera* is, according to Holmes, identical with the plant yielding the “ouabaio wood,” from which Arnaud isolated crystalline ouabain, which is, furthermore, identical with a glucoside subsequently isolated by Arnaud from the seeds of *Strophanthus glaber*; and this glucoside of Arnaud, in turn, is identical with the crystalline strophanthin which Thoms isolated from the seeds of *Strophanthus gratus*. The identity of crystalline ouabain with the strophanthin from *S. gratus* having then become apparent, it should be designated as strophanthin, and, in accordance with the suggestion made several years ago by Prof. Thoms (see Proceedings, 1904, 958), differentiated as g-strophanthin from the other strophanthins as follows:

g-strophanthin = strophanthin from *Strophanthus gratus*.

h-strophanthin = strophanthin from *Strophanthus hispidus*.

k-strophanthin = strophanthin from *Strophanthus kombe*.

e-strophanthin = strophanthin from *Strophanthus Emini*, etc.—Pharm. Ztg., lii (1907), No. 67, 699–700.

*Sakuranin—A New Glucoside from Prunus Pseudo-Cerasus, var. Sieboldi.*—Y. Asahina has obtained and describes a new glucoside, sakuranin,  $C_{22}H_{24}O_{10}$ , from the bark of *Prunus pseudo-cerasus*, var. Sieboldi. It forms white bitter needles, m. p.  $210^{\circ}$ – $212^{\circ}$  C. which are readily soluble in dilute alcohol; sparingly dissolved by strong alcohol and by water. The alcoholic solution gives a yellow color with ferric chloride. When hydrolyzed with acids it splits up according to the equation— $C_{22}H_{24}O_{10} + H_2O = C_{16}H_{14}O_8 + C_6H_{12}O_6$ . The product of the hydrolysis, *Sukarantin*,  $C_{16}H_{14}O_8$ , forms white needles, melting point  $150^{\circ}$  C. It contains a



methoxyl group; on fusion with caustic potash it affords phloroglucinol, acetic acid, and para-oxybenzoic acid.—Apoth. Ztg., xxiii (1908), No. 36, 326; from Journ. Pharm. Soc. of Japan, 1908, 213.

*Saponin*—*Microchemical Detection in Plant Tissues*.—B. Combes describes the following method for detecting saponin in vegetable tissues: Sections of the material to be examined are macerated for twenty-four hours in saturated barium hydroxide solution; saponin is precipitated as the almost colorless barium-saponin compound. The sections are first washed in barium hydroxide solution, then in lime water, which removes the excess of barium hydroxide, but does not dissolve the saponin-barium precipitate. The preparations are then treated with 10 per cent. potassium bichromate solution, which causes the formation of bright yellow barium chromate *in situ* in the cells where the saponin is. Tannin, under these conditions, gives a reddish-brown precipitate, which is quite distinct from the yellow of the barium salt. The sections may be dried and mounted in balsam in the ordinary manner.—Pharm. Journ., Feb. 15, 1908, 191; from Compt. rend., 145 (1907), 1431.

*Santonin*—*Detection of Adulteration with Citric Acid*.—V. Lucchini has found santonin in the Italian market, adulterated to the amount of 25 per cent. with citric acid. This adulterant may be detected, if present in the amount of 10 per cent. or more, by heating 0.1–0.2 Gm. of the santonin on a watch-glass for 15 minutes in a hot closet at 115° C., whereby the powder forms a yellow smelt if it contains citric acid in the quantity mentioned.—Pharm. Ztg., liii (1908), No. 28, 279; from Boll. Chim.-Farm., 1908, No. 1.

*Taxikatin*—*A New Glucoside in the Leaves of Taxus Baccata L.*—Ch. Lefebvre, applying the method of Em. Bourquelot for the determination of glucosides in plants with the aid of emulsin, has succeeded in isolating a new glucoside from the fresh leaves and young twigs of *Taxus baccata* L., in a crystalline condition, which differs distinctly from both coniferin and picein, the only well-characterized glucosides that have heretofore been obtained from coniferous plants. By methods, which are described in detail, 35 Gm. of crude glucoside were obtained from 70 Kgm. of the leaves, which was purified by treatment with a little animal charcoal and repeated recrystallization from hot alcohol—washing the crystals with ether, drying, and finally recrystallizing them from ten times their weight of boiling water. The author has named the new glucoside “taxikatin.” It crystallizes in colorless needles (anhydrous from alcohol; with 2 mol. H<sub>2</sub>O from water—the analytical results leading to the formula C<sub>18</sub>H<sub>26</sub>O<sub>7</sub> + 2H<sub>2</sub>O for the latter), which are mostly grouped to form sphaero-crystals; it is odorless, and has a faintly bitter taste. The anhydrous glucoside melts at 170° to 171° C., the hydrous at 164° to 165° C. It requires 59 parts of water at 20° C., is readily soluble in alcohol and in acetic ether,

but insoluble in ether and in chloroform. Taxikatin is lævorotatory:  $a_D =$  to  $-72.90$ . By hydrolysis with 2 per cent. sulphuric acid, it is split up into glucose (58.0 per cent. and a product which has not yet been obtained in a crystalline condition. The hydrolysis is also effected by emulsin, with production of the same amorphous secondary product and glucose, the latter being fully identified as such by its general characters and its rotatory power ( $a_D = +90.94^\circ$ ). The amorphous product is sparingly soluble in water, copiously in alcohol, and readily in ether. The hydrolysis takes place according to the following equation:  $C_{15}H_{22}O_7 + H_2O = C_6H_{12}O_6 + C_7H_{12}O_4$ . The addition of a drop of fuming nitric acid to taxikatin produces a handsome blue color; to the hydrolytic product a violet color.—Arch. d. Pharm., 245 (1907), No. 7, 486-492.

*Vanillin—Preparation from Guaiacol.*—A. Roesler prepares vanillin from guaiacol as follows: Kieselguhr, saturated with guaiacol, is treated with hydrocyanic acid in the presence of hydrochloric acid and zinc. After contact for forty-eight hours the mixture is treated with a large volume of boiling water and filtered. The filtrate is shaken out with ether, which removes the vanillin and unaltered guaiacol. The vanillin is then combined as the sodium bisulphite compound and crystallized out from petroleum ether. The yield is said to be 70 per cent. of the guaiacol used.—Pharm. Ztg., lii (1907), No. 85, 893.

*Vanillin-Hydrochloric Acid.*—Color Reactions with Albumins is due to the Presence of Triptophane. See *Albumen*, under "Albuminoids."

*Verbenalin—A Glucoside from Verbena Officinalis, L.*—L. Bourdier has obtained by a method described in detail a crystalline glucoside from the fresh flowers of *Verbena officinalis*, L., not hitherto described, which he has named verbenalin. It forms colorless and odorless, extremely bitter needles, which are anhydrous, even when crystallized from water; melts definitely at  $181.56^\circ C.$ , and is optically very active:  $a_D = -180^\circ 52'$ . It is insoluble in ordinary ether and in chloroform, but soluble to the amount of 21.119 per cent. in water, 5.005 per cent. in alcohol (90 per cent.), 1.148 per cent. in absolute alcohol, 4.150 per cent. in methyl alcohol, 0.415 per cent. in anhydrous acetic ether, 1.436 per cent. in hydrous acetic ether, and 0.912 per cent. in acetone. Its composition is represented by the formula  $C_{17}H_{25}O_{10}$ . Verbenalin is hydrolyzed by dilute mineral acids and also by emulsin, the products of hydrolysis being d-glucose and a compound of the composition  $C_{11}H_{15}O_5$ .—Arch. d. Pharm., 246 (1908), No. 4, 272-280.

#### COLORING MATTERS.

*Coloring Matters—Detection in Spices by a Modification of Martin's Butter-Color Method.*—Charles H. La Wall recommends the following modification of Martin's butter-color method, for the detection of added

colors in spices: Mix 15 Cc. of alcohol with 2 Cc. of carbon disulphide and 2 Gm. of the suspected spice; shake thoroughly, and then add 5 Cc. of melted lard, or of liquid-petrolatum, and again shake the mixture vigorously for several minutes. Allow the mixture to separate, decant and filter the alcoholic layer, and apply appropriate tests for the dissolved colors.—*Amer. Journ. Pharm.*, July, 1907, 326-327.

*Plant Pigments.*—I. W. Brandel continues his elaborate studies on "plant pigments," which may be consulted in *Pharm. Rev.*, July (p. 208-211), August (p. 238-241), September (p. 257-260), November (p. 332-339), and December (p. 367-369), 1907; February (p. 44-50), March (p. 65-73), April (p. 119-125), May (p. 141-150), and June, 1908 (p. 185-186).

*Biliary Pigments—Detection in Urine by Means of Eosin.*—V. Mandach finds that the addition of a drop of gall to an extremely dilute solution of eosin changes the rose color of the latter to yellow-brown, which afterwards darkens and assumes a greenish color. The same color changes are produced if the urine of icteric patients, containing biliary pigments, be substituted for pure gall. The reaction is said to be highly sensitive, and is not influenced by the presence of albumen or glucose.—*Pharm. Ztg.*, lii (1907), No. 66, 688; from *D. Med.-Ztg.*, 1907, No. 57.

*Crystallized Chlorophyll—Characters.*—R. Willstätter and M. Benz have succeeded in uniformly obtaining crystallized chlorophyll (first obtained and described by Borodin) by a circumstantial process, which they communicate in detail in *Liebig's Ann. d. Chem.* They describe its characters and properties as follows: Crystallized chlorophyll forms sharply-defined hexagonal and triangular tablets. It is readily soluble in absolute alcohol, methyl alcohol and acetone; its composition is either  $C_{55}H_{82}O_7N_4Mg$  or  $C_{55}H_{84}O_7N_4Mg$ . The solution in ether changes immediately to olive-brown on the addition of ether solution of picric acid. It dissolves also in glacial acetic acid with an olive-brown color, magnesium being eliminated. With caustic potassa it forms as chief product a handsome chlorophyll potassium salt, which is extremely difficultly soluble in alcohol, while the alcoholic mother liquor from which the potassium salt has crystallized retains the salt of another chlorophyll.—*Apoth. Ztg.*, xxiii (1908), No. 19, 191; from *Liebig's Annal. d. Chem.* 1908, 358, 267.

*Crystallized Chlorophyll—Composition and Source.*—Referring to the preceding observation, Dr. Willstätter observes that the crystallized chlorophyll obtained with the collaboration of Dr. Benz has been found to be a magnesium compound, containing 3.4 per cent. of magnesia. Furthermore, that he has found the best plant material for the preparation of the splendid hexagonal tablets of chlorophyll, which have a blue-black color and metallic luster, to be the leaves of *Galeopsis tetrahit*, L., and that 1 Kgm. of the dried leaves yielded 2-2.5 Gm. of the chlorophyll. Un-

fortunately, it appears to be difficult to obtain these leaves on the market, notwithstanding that the plant is distributed over a large portion of Central Europe. Some leaves obtained from the United States, secured after waiting nearly a year, proved to be useless. They were brown and did not contain a trace of chlorophyll.—*Ibid.*, xxiii (1908), No. 52, 467.

*Hematoxylin—Possible Value as an Indicator in the Titration of Phosphoric Acid.*—Dr. A. B. Lyons calls attention to the possible value of hematoxylin as an indicator in the titration of phosphoric acid. In the complete neutralization of the acid by an alkaline hydroxide there are three successive stages corresponding with the formation of phosphates containing in each molecule respectively one, two and three atoms of the alkali metal, and by the use of different indicators, as is well known, these stages may be demonstrated. Such indicators as methyl orange, cochineal and iodeosin, have been used with more or less satisfaction for this purpose, but the accuracy of determinations by their aid is subject to the avoidance of certain disturbing factors, which are briefly pointed out by the author. Hematoxylin as an indicator in alkalinity, although lauded by some, is not in favor with most chemists. Its idiosyncrasies are well illustrated by its behavior towards phosphoric acid during the course of its neutralization with an alkaline hydroxide. When a freshly prepared solution of hematoxylin is added to a sample of diluted phosphoric acid and a volumetric alkaline solution is slowly added, no change is at first produced, except that each drop of the alkali develops a purple color at the point of contact, giving place to a more or less pronounced yellow color in the fluid as it disappears. At a certain point, corresponding with the end of the *first stage of neutralization*, there is a sudden change from yellow to pink or lavender, always occurring sharply, except in the presence of interfering salts, such as sodium chloride for example, whereby the change is deferred. Addition of more alkali now causes a rapid, progressive change to strong amethyst-purple, passing then through purplish-blue or deep violet; then, returning to an amethystine hue, in which red more and more predominates, the color becomes raspberry-red, whereupon comes a sudden change to a peculiar brown color. This marks with considerable exactness *the end of the second stage*. The next drops of alkali change the color to a clear brown, the tint much paler than any that immediately precede or follow; then a change begins which passes on to the development of a garnet color, shading later towards amethyst, and finally resulting in a color resembling that of a solution of permanganate, which does not deepen noticeably on further addition of the reagent. Unfortunately *this does not mark the third stage of neutralization*; it occurs too early, as is shown by the following figures, which express the number of cubic centimeters of decinormal alkali required in the actual experiment and the quantities that should have been required to determine the respective critical points: 3.10, about 6.3 and 8.8 to 9.0,

instead of 3.18, 6.35 and 9.53. While, therefore, reliance can be placed on the determination of the first two critical points with hematoxylin as indicator, there is opportunity for further experimental research if it is desired to make this substance available for the alkalimetric titration of phosphoric acid.—Pharm. Rev., April 1908, 97-101.

*Indigotin—Reaction with Potassium Permanganate.*—Mohr found that when indigotin is oxidized with potassium permanganate, 316.2 parts of permanganate oxidize 750 parts of the indigotin, whereas the amount of the latter theoretically oxidized is 655 parts. O. Miller and J. Smirkoff have repeated the titrations, using specially purified natural and synthetic indigo from which to obtain the indigotin, and they have arrived at a result which agrees with Mohr, viz., that the oxygen used up is a constant amount (12.6 per cent.) too small. The cause of this phenomenon does not lie in the composition of the indigotin. The authors have observed that when indigotin is sulphated no sulphurous acid is evolved, nor is the oxygen of the air taken up by the product of the reaction.—Chem. News, June 26, 1908, 312; from Ber. d. D. Chem. Ges., 41 (1908), No. 7.

*Morindin—Characters and Chemical Relations.*—After reviewing the investigation concerning morindin published by various chemists since its isolation by Anderson (1848) from the root bark of *Morinda citrifolia* L., from which it follows that it possesses a glucosidal nature, that the product of its hydrolysis, "morindon," has the structural composition of a "trioxo- $\beta$ -methylantraquinone," that it may be confidently accepted that morindin is not identical, as was believed by Rochleder, with "rubethrithic acid." O. A. Oesterle and E. Tisz communicate the results of investigation undertaken with the object of throwing further light upon the chemistry of this coloring matter, which possesses particular interest because of the product of its hydrolysis. Morindon is an isomeride of "emodin," in the study of which one of the authors has been engaged for some time. Morindin was prepared from material (*Morinda citrifolia*) received direct from Samarang and Buitenzorg, by a described process. It crystallizes from 70 per cent. alcohol in fine, concentrically grouped, light yellow, faintly bitter needles, the crystallization being extremely voluminous, but it does not crystallize readily from hot water, from which it is deposited as a gelatinous mass on cooling. It is readily soluble in acetone, glacial acetic acid, acetic anhydride, xylol and pyridine, less readily soluble in diluted alcohol, and still less in absolute alcohol, and insoluble in ether, chloroform, benzene and petroleum ether. From its aqueous or alcoholic solutions morindin is precipitated by basic lead acetate and aluminum salts in the form of a voluminous, flocculent red lake. Ferric chloride colors its solutions dark brown. In concentrated sulphuric acid it dissolves with a purple-red color, in hydrochloric acid with a yellow and in nitric acid with a dark brown color, but it is insoluble in dilute acids. It is very readily dissolved

by alkalis, forming red solutions. Neither ammoniacal silver solution or Fehling's solution are reduced by morindin. When heated in a capillary tube it begins to sublime at  $235^{\circ}\text{C}$ ., melts at  $245^{\circ}\text{C}$ ., forming a brown-red liquid, and boils at  $247^{\circ}\text{C}$ . It contains no water of crystallization, its ultimate composition agreeing well with the formula  $\text{C}_{27}\text{H}_{30}\text{O}_{15}$ , which differs from that originally assigned to morindin by Anderson ( $\text{C}_{28}\text{H}_{30}\text{O}_{16}$ ), and also that of Thorpe ( $\text{C}_{28}\text{H}_{28}\text{O}_{14}$ ). Morindin is not split up by the action of emulsin or the yeast ferment, nor is it hydrolyzed by heating with water under pressure to  $100^{\circ}\text{C}$ ., by electrolysis or by alkaline carbonates, even under prolonged heating. It is split up, however, by prolonged heating with caustic alkalis, and by prolonged action at the ordinary temperature by concentrated sulphuric acid, while hydrolysis results very easily by heating its alcoholic solution with diluted mineral acids or acetic acid. The products of the hydrolysis consist of 45.49 per cent. morindin and 60.42 per cent. sugar, and these figures agree well with the equation,  $\text{C}_{27}\text{H}_{30}\text{O}_{15} + 2\text{H}_2\text{O} = 2\text{C}_6\text{H}_{12}\text{O}_6 + \text{C}_{15}\text{H}_{10}\text{O}_5$ , which demands 45.44 per cent. morindin and 60.61 per cent. sugar.

*Morindon*, which separates as an insoluble precipitate during the hydrolysis is readily obtained pure by several crystallizations from 70 per cent. alcohol, forming a fine, red-brown, metallic (bronze-like) glistening, crystalline powder. From toluol it crystallizes in short, compact, crooked, vermilion-red needles, arranged fan-shaped. By sublimation it is obtained in long, orange-red needles. It melts at  $272^{\circ}\text{C}$ ., is readily soluble in alcohol, methyl alcohol, ether, acetic ether, benzol, xylol, toluol, cymol, pyridine and glacial acetic acid, but insoluble in petroleum ether or water. It dissolves in alkalis and in concentrated sulphuric acid, forming blue-violet solutions—the alkaline solution turning reddish on addition of potassium carbonate and fading slowly. The addition of baryta water to the ammoniacal solution produces a cobalt-blue, flocculent precipitate, and solution of alum produces a red lake. While, according to the investigations of Thorpe and Greenall, morindon has the structure of a trioxymethylanthraquinone, of which 35 different ones are theoretically possible, the authors have not been able to identify it with any of those that have so far been isolated from plants or have been obtained artificially, nor can a similarity with these, such as is usually found in homologous compounds, be recognized from the description of these in the literature.

*The Sugar* obtained by the hydrolysis of morindin has not yet been definitely identified. It is not identical with glucose, and, although it resembles invert sugar in some of its relations, it is not fermentable. It appears possible that, like in ruberythric acid, the sugar is present in the form of a biose, but this biose differs from the sugar of ruberythric acid in that it does not yield grape sugar by the inversion attending the hy-

drolysis. In the course of their investigation the authors prepared and studied the nonacetyl- and nonabenzoyl-derivatives of morindin, triacetyl-morindon, morindon trimethyl ether, etc., with the object of ascertaining the constitution of morindin. They assume as the result of their investigation that morindin contains two free phenylhydroxyls, and that the sugar-rest is combined as hexabiose with the third hydroxyl.—Arch. d. Pharm., 245 (1907), No. 7, 534–553.

*Rottlerin—Oxidation Products and Derivatives.*—Dr. Franz Herrmann communicates the results of a series of investigations undertaken with the object of clearing up the constitution of rottlerin, from which it appears that the isorottlerin of Perkin does not exist, but that it is identical with rottlerin, for which he confirms the empirical formula,  $C_{23}H_{30}O_6$ , of Perkin. By oxidation with hydrogen dioxide in alkaline solution, cinnamic acid is produced along with the benzoic acid already noticed by Perkin. By the hydrolysis of rottlerin with potassium, or sodium hydroxide in the presence of nascent hydrogen, methylphloroglucin and dimethylphloroglucin were determined among the products of reaction; and by the careful oxidation with hydrogen dioxide of the resinous body, obtained as a by-product in the hydrolysis of rottlerin in alkaline solution, a new carbon acid, having the empirical formula  $C_{17}H_{16}O_6$ , was identified by the author, and its dinitro-derivative, the corresponding amine, a dibromine compound and the ethyl ester were prepared.—Arch. d. Pharm., 245 (1907), No. 8, 572–585.

## ALBUMINOIDS.

(Including Animal Products).

*Albuminoid-Derivatives—Chemical Exposé.*—August Drescher, supplementary to Prof. Hommel's paper on "Lecithin" (which see) says that albuminoid bodies, generally are best considered under the following classes: Nucleins, cholestrins, enzymes, and lecithins. A number of these have recently been brought to our understanding, after a great deal of serious laboratory-experimenting and consequent theoretical studies and discussions by our highest authorities in Europe (chiefly Germany), but many, as yet, remain "Gordian knots without their Alexander," although their general physical properties, and even their chemical deportment with reagents, etc., may be well known; their molecular structure, however, is not only very complex, but represents a very high molecular number. Mr. Drescher enumerates and briefly describes the following albuminoid bodies and derivatives that have been proposed in one form and another for therapeutic purposes: *Protagon*, allied to lecithin, obtained from the brain; *normal lecithin*, the true type of the lecithin-class of albuminoids, obtained from brain, nerves, blood, yolk of eggs, and plant seeds, and by decomposition resolves into *choline* and glycosophosphoric,

stearic and palmitic acids; *spermine*, ( $C_2H_5N$ ) and its derivative, *vinylamine*, ( $C_2H_5NH_2$ ) from the human semen, and in the heart, liver and testicles of young oxen; *neurinel*, trimethyl-vinylamine= $C_2H_5N(CH_3)_3OH$ , accompanying *neuridine*, ( $C_8H_{14}NO_2$ ) generated in putrid meat and fish, and prepared by treatment of protagon with baryta, or by heating the bromide with silver oxide. In the study of these bodies it must be remembered that the field is quite new as yet. So much is certain, however, that enthusiasm should not run ahead of reason; the questions involved must be decided in each case by clinical observations coupled with pharmaceutical watchfulness.—Proc. N. J. Pharm. Assoc., 1907, 59-62.

*Vegetable Albumens—Biological Method of Differentiation.*—The good results obtained by Uhlenhut, Wassermann and other investigators with the sero-diagnostic method for the differentiation of animal albumens, have suggested to D. Gasis the possibility of also differentiating plant albumens by means of this precipitation-reaction. Rabbits were immunized by intravenous and, partly by subcutaneous injections of solutions of rye, rice and bean albumens for two months, and others with animal albumens in the same way. Comparative experiments were then made with the sera obtained in this way from the immunized rabbits to determine their precipitant effect upon the homologous serum solutions as well as such of pigs and horses. The results show that the various plant albumens may be differentiated by the biological method in concentration, which in the case of animal albumen do not yet afford precipitations.—Pharm. Ztg., liii (1908), No. 2, 212; from Berl. Klin. Wschr., 1908, No. 7.

*Albumins—New Solvents Useful for their Separation.*—J. Ostromysslensky has found concentrated solutions of formamide and of acetamide (m. p.  $85^\circ C.$ ) to serve well for the solution and separation of certain albumins from each other. Thus, for example, the peptone from egg-albumin is soluble in acetamide to the amount of over 30 per cent., whereas the albumins themselves (egg-albumin, serum-albumin, etc.) are insoluble in the same solvent. The observation may prove useful when it is desirable to separate two kinds of albumin from each other, or for the expeditious purification of albumoses and peptones from inorganic components, since the amide-solutions mentioned may be filtered with facility.—Pharm. Ztg., lii (1907), No. 89, 934; from Journ. f. prakt. Chem., 1907, No. 17.

*Albumen—New Reaction.*—B. Bardsch finds that when iodine reacts upon albumen solutions containing acetone, the formation of iodoform from the latter is prevented, and instead of the characteristic hexagonal leaflets of iodoform a precipitate of yellow needle-shaped crystals results. The same characteristic yellow precipitate is produced by an entire series of albumens and proteids, and seems to be available for establishing the



identity of all true albuminoid bodies.—Pharm. Ztg., liii (1908), No. 38, 380; from Ztschr. f. physiol. Chem., 1908, through Chem. Ztg., 1908, No. 29.

*Albumen—Reaction with Vanillin-Hydrochloric Acid.*—The assumption of Dr. Max Winkel that the violet color produced with certain seeds, and in other substances, by the vanillin-hydrochloric acid reagent is characteristic of enzymes present in them (see Proceedings, 1905, 845), has induced L. Rosenthaler to inquire experimentally into the possibility that the reaction may simply be due to the associated albumins. He found, in fact, that albumen, globulin, and casein gave a very handsome violet coloration with the reagent. But the possibility still existed that the reaction might be due to a product of the hydrolysis of the albumins. Of hydrolytic products of albumen that come into consideration, negative results were obtained with phenylamine, tyrosine, histidine, and  $\alpha$ -pyrrolidine carbonic acid; but tryptophane gave the same violet coloration with vanillin-hydrochloric acid as did the above-mentioned albumins. Rosenthaler concludes from these observations that the color reaction observed in the albumin is due to the presence of tryptophane.—Apoth. Ztg., xxii (1907), No. 65, 678.

*Copper Albuminate—Indefinite Composition.*—The so-called copper albuminate is obtained by saturating an aqueous solution of albumin with cupric sulphate and washing the fine, dull blue precipitate repeatedly with water to remove impurities. According to M. Monier this product is soluble in hydrochloric acid, forming a clear solution; but if this solution is treated with more hydrochloric acid, or some other acid, or if it is heated to above 50° C., the albumen is precipitated as such, and the copper remains in solution as a salt of the acid employed. This determines the copper albuminate to be a very loose compound. Moreover, the compound is soluble in excess of solution of potassium hydroxide, and gives the biuret reaction without the further addition of cupric sulphate. Hence the author concludes that the latter is present as such in the blue precipitate obtained as above mentioned, and that, therefore, the so-called "cuprum albuminatum" is not a definite compound of albumen and copper. Its solution in potash does not precipitate albumen on boiling.—Pharm. Ztg., lii (1907), No. 72, 748; from Jour. de Pharm. d'Anvers, 1907, No. 15.

*Blood—Detection by Means of Bensidine Paper.*—M. Einhorn finds that the benzidine-reaction for blood (see *Bensidine* under "Organic Bases") is conveniently carried out by means of

*Bensidine Paper.* This is obtained by immersing filter paper in a solution of benzidine in glacial acetic acid and drying, avoiding to touch the paper with the fingers during this preparation, or when making the test, since sweat produces a similar reaction to that of blood. The reagent

paper is dipped into the liquid under examination, then placed on a porcelain plate and a little hydrogen dioxide is dropped on it. In the presence of blood in the proportion of 1 part to 500 parts of water, a distinct blue color is developed in 30–60 seconds, while in dilution of 1 : 2000 the reaction requires 1–2 minutes. Observations should not be extended beyond these time-limits, since by prolonged action (13 minutes) a trace of blue color manifests itself even when no blood is present.—Pharm. Ztg., lii (1907), No. 66, 688; from D. Med. Wschr., 1907, No. 27.

*Opsonins*—*A New Class of Bodies in the Blood Serum*.—See "Introductory."

*Hemoglobin*—*Application of Guaiaconic Acid as a Test*.—In view of the availability of guaiaconic acid ( $C_{20}H_{24}O_5$ ) as a product now on the market, O. Doebner proposes, instead of tincture of guaiac to use a solution of 0.1 Gm. guaiaconic acid in 20 Gm. alcohol and 20 Gm. water, as a test for hemoglobin. This solution must always be freshly made before use, the test being carried out in strict conformity regarding quantities of the reagents, as follows: The substance to be tested in a porcelain crucible, moistened with 1 Cc. concentrated ammonia, and allowed to stand at the room temperature for 24 hours until the ammonia has evaporated off, after which 3 to 4 Cc. water are added, allowed to stand for several hours, the mixture filtered, and the filtrate evaporated on the water-bath to a small bulk. 0.15 Cc. of the residue is then mixed with some 1 per cent. citric acid solution, 5 Cc. of a 0.5 per cent. alcoholic guaiaconic-acid solution, and 1 Cc. ozonized turpentine oil added, and the whole shaken. If but 0.0007 Gm. hemoglobin is present, a positive guaiac reaction (blue coloration) is afforded, the reaction being independent of any iron, and being due solely to the hemoglobin.—Merck's Rep., Febr., 1908, 46; from E. Merck's Rep. for 1907.

*Hirudin*—*Investigations Concerning its Action on Blood*.—It is well known that blood flowing from the bite of the leech does not coagulate, a phenomenon which has been attributed to the action of a substance secreted by the salivary glands of the leech. Investigations taking advantage of the fluidity have recently been made by I. Barcroft and G. R. Mines, with the object of determining whether any alteration takes place in the gases of the blood. The quantity of the active principle, hirudin, injected was 0.2 Gm. per 5 kilograms of body-weight of the animal, the strength of the solution being about 1 per cent. Preliminary experiments showed that hirudin has no specific effect on the gases in drawn blood. When injected subcutaneously it was found that the oxygen in the arterial blood rose to a variable extent, while the carbon dioxide fell. The respiration was quickened, an effect that followed quickly upon a considerable fall in the blood pressure. The increased respiration decreases the amount of carbon dioxide in the blood to a slight extent, and tends

also to increase the oxygen. If hirudin be injected too rapidly death may occur.—Pharm. Journ., Mar. 7, 1908, 319; from Lancet, 32 (1908), 578.

*Casein—Preparation for Replacing Egg-Albumen.*—According to Pansiot casein treated in the following manner is suitable for replacing albumen for a variety of industrial purposes. The casein, in water, is mixed with an excess of alkali, preferably soda, and is then treated with 5 to 10 per cent. of its own weight of sodium peroxide, added by degrees, with vigorous stirring. The mixture is gradually heated to 65° to 75° C., without ceasing to stir the mass, and the oxidation of the casein may be regarded as complete when the solution becomes clear and all liberation of gas ceases. This clear solution is cooled down to 15° to 20° C., whereupon small quantities of dilute hydrochloric acid (1:10) are stirred in till the mass becomes milky. The precipitate is allowed to subside, is collected, and pressed to remove the surplus saline matters, after which it is washed by trituration with water, care being taken not to prolong the operation so as to dissolve too much of the product. Finally, the precipitate is spread out on sheets of glass, and dried, either in the open air or by a current of air heated to not more than 35° to 40° C., or in any other convenient manner. The product is slightly yellow, translucent, and suitable for replacing egg-albumen, the properties of which substance it possesses.—Pharm. Journ., April 18, 1908, 518; from Rév. Prod. Chim.

*Cheese and Milk—Bitterness Due to Aldehyde Resin.*—Trillat and Sauton find that the peculiar bitterness which characterizes certain cheeses is found to be due to the presence of aldehyde resin formed by the action of ammonia on aldehyde, and those cheeses with the most pronounced bitter taste are found to contain most aldehyde. To determine the quantity 200 Gm. of cheese is rubbed down with 200 Cc. of water, acidified with 10 Cc. of 10 per cent. sulphuric acid distilled into a receiver, and cooled in a freezing mixture until 50 Cc. of distillate has been collected. The aldehyde is then determined colorimetrically with aniline bisulphite solution. Fresh curd contains no aldehyde, but on exposing this or fresh cheese free from aldehyde to the vapor of acetic aldehyde, the color slowly deepens, and the bitter taste becomes more and more pronounced. The darkening in color is not, however, due to the aldehyde vapor alone, but to oxidation. When air is excluded, the bitterness is produced without any marked change of color. The quantity of aldehyde in various cheeses expressed in terms of acetic aldehyde varies greatly; Gruyère, Camembert, and Dutch cheese contain only traces; Roquefort with 27 Mgm. per kilo, and Gorgonzola with 29 Mgm. contain most. Other French cheeses give amounts intermediate between these two extremes.—Pharm. Journ., July 27, 1907, 103; from Compt. rend., 144 (1907), 332 and 926.

*Top-Milk—Advantages for Infant Feeding and Method of Obtaining.*—

In an exhaustive review of the comparative composition of human and cow's milk, Joseph W. England winds up by calling attention to the fact that the top-milk system of infant feeding is rapidly coming into medical favor. By diluting top-milks with water, or with water and whole milk, it is possible to obtain mixtures for infant feeding that contain a higher percentage of fat with a normal percentage of proteids, than is possible to obtain with any dilutions of cow's milk. The top-milks, moreover, are superior to creams, not only because the fat percentages are more uniform, but also, what is equally or more important, the dilutions do not readily separate on standing into strata of different fat-percentages. Infants fed with stratified mixtures are fed an excessive amount of fat in the first portions of the food, which is just the reverse of what obtains in the feeding of human milk.

Top-milks are the upper portions of a quart bottle of cows' milk which has stood in a cool place until a creamy layer has formed. They are obtained with the use of a tin or aluminum dipper devised by Chapin. The dipper, which holds 1 fluidounce, is gently immersed in the liquid, filled, removed, and the contents emptied into another vessel and mixed. The first two dippings, mixed, constitutes 2-ounce top-milk, or the first four dippings 4-ounce top-milk, or the first eight dippings 8-ounce top-milk, etc. Little or no disturbance of the different layers of the liquids results from the act of dipping. The creamy layer usually constitutes about 5 or 6 fluidounces, varying according to the original fat percentage of the milk and the length of time standing. It includes practically all the fat of the milk. Eight-ounce top-milk or over contains not only the cream, but some nearly fat-free milk also.—*Amer. Journ. Pharm.*, Febr., 1908, 55-66.

*Milk—Determination of Added Water by the Freezing-Point.*—Dr. Philipp Fischer demonstrates the feasibility of determining the quantity of added water in milk by means of the freezing-point, which for normal cow's milk has been shown to range from  $-0.54^{\circ}$  C. to  $-0.58^{\circ}$  C., but in most cases to be  $-0.56^{\circ}$  C. The addition of water raises the freezing-point towards the normal freezing-point of water ( $= 0^{\circ}$  C. at 760 Mm. pressure), and the differences permit the recognition of the percentages of added water within certain limits. In twenty experiments the freezing-point of normal milk, to which 5 per cent. of water was added, was raised to  $-0.53^{\circ}$  C. in 14 samples, to  $-0.54^{\circ}$  C. in 5 samples, and to  $-0.55^{\circ}$  C. in 1 sample; but the addition of 10 per cent. of water gave figures which are quite available for determinations by the proposed method, namely:  $-0.51^{\circ}$  C. in 10 samples,  $-0.50^{\circ}$  C. in 8, and  $-0.55^{\circ}$  C. in 2 samples; while the addition of 20 per cent. of water to the same number of samples of milk showed freezing-points of  $-0.47^{\circ}$  C. in 13, and  $-0.46^{\circ}$  C. in 7 samples. If, as is suggested by the author,  $-0.56^{\circ}$  C. is accepted as the freezing-point for normal cow's milk, the method, while not available for

the recognition of an addition of 5 per cent. of water, becomes available for the recognition of 10 per cent. of added water, since numerous experiments have failed to show as high a freezing-point as  $-0.52^{\circ}$  C. for normal milk; and with 20 per cent. of added water, the differences from the normal freezing-point of milk are so large that its recognition is beyond dispute. The author concludes that the cryoscopic examination of milk for the presence of water has the following advantages over other methods commonly in use: (1) Positive recognition of added water from 10 per cent. upward, even in milk rich in fat; (2) greater accuracy; and (3) more convenient manipulation.—Pharm. Ztg., liii (1908), No. 5, 48-49.

*Milk Mixtures for Infant-Feeding—Conditions to be Met in their Preparations.*—In reply to the query "Is it possible for the pharmacist to prepare modified milk mixtures for the percentage feeding of infants?" R. H. Lakey says that from an experience gained in the home, his opinion is in the negative. The theory of the use of modified milk contemplates the prescription by the physician of certain proportions of milk, cream, sugar of milk, representing the proteids, fat and sugar of milk and water to suit the age or condition of the infant. The proportions are apt to be changed if the child be delicate, as often as two or three times a week, requiring oftentimes the preparation of a second formula before the supply of the first has been exhausted. To carry out such work properly, so as to meet every demand, would require a special laboratory, an extensive sterilization outfit and a large refrigerating capacity. From a business standpoint it seems to the author a very unpromising enterprise for the pharmacist whose business is confined to a neighborhood or small town. The proper preparation of the milk depends upon the intelligent care and attention of the mother, or the nurse, and to Mr. Lakey's mind does not come within the province of the pharmacist.—Proc. Pa. Pharm. Assoc., 1907, 113-114.

*Milk—Detection of Added Water, etc., by the Freezing-point and Specific Gravity.*—W. R. Gelston Atkins also finds it practicable to demonstrate with certainty the presence of added water in cows' milk by the determination of the freezing-point and the specific gravity. The freezing-point of cows' milk is  $-0.55^{\circ}$  C.; the variations from this only rarely exceed  $0.03^{\circ}$  C. above or below this mean. The determination of the freezing-point and specific gravity of a sample of milk are sufficient to show, on the one hand, whether it has been diluted with water, and, on the other, whether fat has been removed. The freezing point of milk, however, is not affected by the presence or absence of fats.—Chem. News, May 22, 1908, 241-242.

*Milk—Estimation of Germs by Means of Indigo-Carmine.*—The method proposed some years ago by Vaudin for the estimation of germs in milk, which is used extensively in the French dairy industry, depends

upon the decolorization of indigo-carmin, due to the reducing action of the aerobic micro-organisms present in the milk. If 100 Cc. of milk are mixed with 5 drops of indigo-carmin solution (1 : 1000) and the milk is exposed in a well-closed flask to diffused sunlight at the ordinary temperature, the light blue color produced by the reagent disappears and the milk re-assumes its normal white color with greater or less rapidity, dependent on the quantity of germs contained in it. While in milk obtained under careful conditions of milking and cleanliness, the blue tint does not entirely disappear before the expiration of 48 hours, milk obtained with less care, may lose the blue color within a few hours after milking. The only defect hitherto existing in the method, consists in the variability of the indigo-carmin of commerce. Vaudin, therefore, now advises that the reagent be standardized in such manner that a solution of indigo-carmin, 1 : 1000, shall be decolorized by an equal volume of permanganate solution, 0.15 : 1000. This is effected by adding 10 Cc. of dilute (10 per cent.) sulphuric acid to 1000 Cc. of the reagent and titrating this mixture with the permanganate solution of the specified strength, until the blue color is changed to yellow. The adjustment is then made on the basis that 100 p. of the carmin require 15 p. of permanganate for complete reduction.—Pharm. Ztg., lii (1907), No. 89, 934 ; from Journ. de Pharm. d'Anv., 1907, No. 18.

*Milk—Pasteurization Insufficient to Kill the Tubercle Bacillus.*—Experiments by D. A. de Jong, which are at present in progress, lead to the conclusion that the heating of milk for half an hour at 71°–72° C., is not always sufficient to kill tubercle bacilli, and that hence pasteurization is not as efficient a safeguard as boiling.—Pharm. Journ., April 11, 1908, 486 ; from Milchwirtschaftl. Zentralbl., 4 (1908), 13–17.

*Milk—Simple Test to Determine whether Boiled or Raw.*—L. Gaucher recommends the following simple reaction for distinguishing boiled from raw milk : To 20 Cc. of the milk add 20 drops of a freshly prepared solution of 0.2 Gm. haematin (prepared by Grüber's method) in 20 Cc. of water, and shake well. With boiled milk the color is discharged in a few minutes, whereas with raw milk the rose color is retained for 24 hours. The rapidity of the discharge of color depends upon the degree of heat to which the milk has been subjected. In pasteurized milk, heated only to 70° C., the color slowly disappears in about 10 minutes, more rapidly at higher temperatures. If the heating has been done with exclusion of air, the color remains, but becomes markedly paler.—Pharm. Ztg., liii (1908), No. 48, 477 ; from Chem. Centralbl., 1908, i, No. 21.

*Milk—Detection of Hydrogen Dioxide.*—According to E. Feder the presence of hydrogen dioxide in milk is readily and positively determined if, after the addition of a drop of dilute formaldehyde solution the milk is mixed with an equal volume of conc. hydrochloric acid (sp. gr., 1.19). A

magnificent blue-violet color is developed at the temperature resulting from the reaction ( $30^{\circ}$ – $35^{\circ}$  C.), if fairly large additions of  $H_2O_2$  have been made. On boiling the mixture it is developed immediately. C. Amthor, however, points out that on boiling pure milk with conc. hydrochloric acid dirty-violet colorations are also liable to result, which are due to a reaction between the albumen bodies and the lactose of the milk. But colorations from this source do not occur up to  $60^{\circ}$  C., a temperature which is sufficiently high to permit the determination of  $H_2O_2$  in milk by means of formaldehyde and hydrochloric acid. The test is best applied by placing the test-tube containing a mixture of 5 Cc. each of the milk and conc. hydrochloric acid with 1 drop of the dilute formaldehyde solution into a water-bath at about  $60^{\circ}$  C., shaking it occasionally and noting the effect after a short time (at most 3–4 minutes). A fine reaction is obtained in the presence of 0.01 per cent.  $H_2O_2$ ; a distinct reaction with 0.006 per cent., and a faint violet color with 0.003 per cent. Milk, free from  $H_2O_2$ , under these conditions simply develops a yellow color.—Pharm. Ztg., liii (1908), No. 21, 213; from Ztschr. f. Unters. d. Nahrungs-., 1908, No. 4.

*Kefir and Its Preparation* is comprehensively discussed in a paper by I. V. S. Stanislaus, in the "Proceedings" of this Association, 1907, 465–469.

*Yoghurt*, an ancient nutrient preparation partaking of the nature of kefir and kumys, and popularly used in the Orient, particularly in Bulgaria, has recently attracted considerable attention—probably for the reason that the ferment necessary for its preparation has been the object of controversy, and is exploited under various designations by different manufacturers, such as "Maya" (powder and pastilles), "Lactoferman Odier" (Comprimés de Lacticoose Organique), and "Yoghurt Tablets." All of these preparations, however, apparently fail to replace the genuine ferment, properly called "maya," in the fresh state. They yield a product different from the agreeably tasting "genuine yoghurt," which is said to be obtained as follows: Milk is evaporated to one-half or one-third its original volume, the ferment is added and the mass, in pots, enclosed in a Turkish boiling chest, or in a comparatively warm place, since the "maya" does not become effective below  $50^{\circ}$  C. After 8 to 12 hours (from morning until night) the yoghurt is finished. It has the consistence of pudding, and an agreeable creamy, sweet, and very slightly acidulous taste. It is consumed with the addition of sugar and grated bread, which are spread over the surface.—Pharm. Ztg., lii (1907), No. 84, 880; from Therap. Monatsh., 1907, No. 10.

*Emulsin*.—Process of Preparation for the Detection of *Glucosides*, which see under "Glucosides and Neutral Principles."

*Pepsin*.—*Rapid Method of Estimation of its Potentiality in the Gastric*

*Fluid*.—O. Gross recommends the following method for rapidly determining the potentiality of pepsin in the gastric fluid: 1 Gm. of casein puriss. (prepared by Hamarsten's method) and 16 Cc. of 25 per cent. HCl (sp. gr. 1.124) are dissolved in 1 liter of water on a water-bath. A number of portions, each of 10 Cc., of this solution, previously heated to 39°–40° C., are then filled into a series of test-tubes, and the gastric fluid under examination is then added in successively increased portions. The tubes are then allowed to remain 15 minutes in the thermostat (or in a closed vessel containing water at 40° C.); a drop of concentrated solution of sodium acetate is now added to the contents of each tube and the effect noted. The formation of a precipitate denotes the presence of undigested casein, whereas the fluid remains clear if complete conversion into caseose is effected. In this way it is possible to determine the pepsin value of the gastric juice within a period of little more than 15 minutes, even if the pepsin is present only in the smallest quantity, after a unit has been adopted for comparison with pepsin solutions of known strength.—Pharm. Ztg., liii (1908), No. 29, 289; from Berl. Klin. Wschr., 1908, No. 13.

*Pepsin—Influence of Colloidal Metals on its Digestive Action*.—L. PinCUSOHN has studied the effect of colloidal metals on the digestive activity of pepsin, and finds this to be negative in most cases. It is not accelerated by any of the colloids; it is retarded least by electrically-prepared colloidal metals, and more pronounced by ferric hydroxide and by colloidal metals produced by chemical methods and containing albumen as a colloidal protective.—Pharm. Ztg., liii (1908), No. 21, 213; from Biochem. Ztschr., 1908, Nos. 5 and 6.

*Pepsin and Pancreatin*.—F. C. Koch criticises the U. S. P. methods for assaying pepsin and pancreatin and recommends certain modifications, in the "Proceedings" of this Association, 1907, 372–377.

*Predigested Foods*.—The food value of predigested foods is discussed by A. R. L. DOHME, in a paper communicated to this Association, see "Proceedings," 1907, 505–506.

*Gastric Juice—Acceleration of its Secretion by Iodine Preparations*.—The experiments of J. FEIGL on animals have positively determined that iodine preparations accelerate the secretion of gastric juice. In all cases of preparations in which the iodine is convertible into iodion (I') the acceleration of this secretion is particularly pronounced. The author employed in his investigations the following medicaments: Sodium iodide, potassium iodide and iodate, lithium iodide, soiiodine, iodipin, iolecithin, iothion, methyl iodide, iodglidine and very dilute solutions of free iodine.—Pharm. Ztg., liii (1908), No. 21, 213; from Biochem. Ztschr., 1908, Nos. 5 and 6.

*Intestinal Secretions—Source of Alkalinity*.—E. POLLACCI observes that the alkaline reaction of the intestinal secretions is generally attributed to



the presence of sodium carbonate or bicarbonate. It has been observed, however, that red litmus paper, which has been colored deep blue by contact with the secretions, gradually loses part of its blue color by exposure to dry air or on warming, indicating that the reaction is not due to fixed alkali. Investigation of the intestinal secretion of the pig has confirmed this, and demonstrated that the alkalinity is due to the presence of ammonia loosely combined in the form of readily dissociated salts, very probably as oleates.—Schw. Wschr. f. Chem. u. Pharm., xlv (1908), No. 7, 94; from Bull. Chim., 1907, No. 21, 789.

*Protagon.*—*A body of Constant Chemical Composition.*—R. A. Wilson and W. Cramer communicate the results of investigations upon which they base the claim that protagon, a constituent of the substance of the brain about which there has been much controversy, is a body of constant chemical composition. Confusion has existed by reason of the tendency to identify protagon by its method of preparation rather than by the evidence of analytical results. It is now shown that in certain methods of isolation hitherto adopted, repeated crystallization and prolonged contact with alcohol has resulted in decomposition of the substance, a number of bodies varying widely in their phosphorus percentage and in their solubility in alcohol and ether being formed. The method of preparation now adopted is one in which the length of time during which the hot or warm solvent in contact with the material is shortened as much as possible. The brain mass is made into a pulp and treated repeatedly with 96 per cent. alcohol. The extraction is accelerated by shaking, the material being kept afterwards in an ice chest. After three or four extractions ether is added instead of alcohol, and the treatment continued until lecithin and cholesterin are completely extracted. After removing the ether and drying the remaining mass by exposing it to the air, a brown mass remains which can easily be finely pulverized. This is extracted by boiling for one or two minutes with absolute alcohol; the solution is filtered through a hot-water funnel, and the filtrate cooled on ice; the process of extraction is repeated twice. The crude crystalline product is washed with ether and dried *in vacuo*. It is then re-crystallized from boiling absolute alcohol. Analysis shows that its composition is about as follows: C, 66.37 per cent.; H, 10.82 per cent.; N, 2.29 per cent.; P, 1.04 per cent.; S, 0.71 per cent. The figures obtained for the specific rotation vary between  $[\alpha]_D^{20} = +6.61$  and  $+7.01$ ; the refractive index (3 per cent. solution at 30° C.), between 1.5032 and 1.5034. It was formerly held that pseudo-cerebrin was extracted from the brain along with protagon, from which it had to be separated, but it is now shown that this substance (which is identical with cerebrin) is formed from protagon by the hydrolyzing action of warm alcohol. While the results recorded appear to prove that protagon is a definite chemical compound, it is possible that several protagons exist just as several lecithins exist.—Pharm.

Journ., Mar. 21, 1908, 383; from Quart. Journ. Experim. Physiol. i (1908), No. 1, 97.

*Lecithin—Preparation from Bone-marrow.*—According to W. Glikin the lecithin content of bone-marrow is most abundant in young animals or man. In such it was found up to 37 per cent.; whereas in the bone-marrow of older animals it was present only in the amount of 1.5 to 5 per cent., and in that of man about 2.4 per cent. W. Otolski recommends the following method for its preparation from bone-marrow: Extraction with 96 per cent. alcohol by the aid of heat; addition and treatment of the alcoholic extraction with ether; separation of the precipitate by decantation; evaporation of the ether-alcohol solution to dryness; solution of the dry residue in ether; and precipitation of lecithin from its solution in ether by acetone. To obtain the lecithin perfectly pure it is recommended to precipitate it from its alcoholic solution by refrigeration with liquid air.—Pharm. Ztg., lii (1907), No. 65, 680: from Biochem. Ztschr., 1907, vol. 4.

*Lecithin—Bacteriolytic Properties.*—R. Bassengé has made some interesting observations on the bacteriolytic properties of lecithin in the course of experiments made with sterilized lecithin emulsion on typhus bacteria. He found that the latter are immediately dissolved by a 1:100 emulsion of lecithin with water. In a 1:1000 emulsion, solution is not effected before 30 to 60 minutes, nor in the same degree; while emulsions of 1:10000 only manifest traces of the bacteriolytic properties of lecithin. Further investigations proved that although it was impossible to produce an immunizing toxin for typhus under the conditions of experiments made, it was quite possible to obtain a typhus antitoxin by appropriate treatment of lecithin emulsions, which has proven serviceable in effecting the recovery of guinea pigs within 24 hours after their infection with several times the lethal dose of typhus bacillæ.—Pharm. Ztg., liii (1908), No. 9, 88; from D. Med. Wschr., 1908, No. 4.

*Lecithin—Not a Definite Compound.*—According to the experiments of N. A. Barbieri, which are described in detail, four definite bodies have so far been isolated from egg yolk by means of neutral solvents, namely: tristearin and triolein, ovine, a nitrogenous body rich in sulphur and phosphorus, and resembling Goble's cerebrine; cholesterol; and crystalline sulphur of undetermined origin. The lecithin of previous workers is considered to be a mixture of these substances.—Pharm. Journ., Aug. 31, 1907, 316; from Compt. rend., 145 (1907), 133.

*Lecithin—Problematic Utility as a Medicament.*—Professor P. E. Hummel observes that lecithin,  $C_{44}H_{84}NO_5P$ , a very complex organic (albuminoid) substance, so widely distributed in animal and vegetable tissues, especially in the yolk of egg, is indeed peculiar and interesting from a chemical, medical and physiological standpoint, and much has been said

about it of late. Physiologically, it is claimed by some that it increases the red corpuscles and that bodily weight is increased. Theraputists are therefore exhibiting it in certain diseases, and it is supplied in a number of forms—elixirs, cordials, etc., for the treatment of neurasthenia and other nervous diseases. The Antwerp Pharmaceutical Association has adopted a formula for a codliver oil emulsion containing it. But in his experience, no satisfactory results have been obtained by its use; it has proven practically worthless, and its administration in some cases has been attended with disagreeable effects on the stomach, causing nausea, due very likely, to decomposition with which apparently it “winds up.” He can see no future for it from a therapeutic standpoint.—Proc. N. J. Pharm. Assoc., 1907, 58–59.

*Cholestrin—Occurrence, Physical Characters, Constitution and Chemical Relations.*—Introducing a detailed description of a comprehensive study concerning the chemical relations and constitution of cholestrin, A. Windhaus gives a brief historical account of this peculiar substance, which was discovered by Chevreul towards the end of the 18th century in human gallstones, and which, owing to its resemblance to fats in its solubilities, he had named “gall-fat.” Since then investigations have demonstrated that cholestrin (cholesterin) is a widely distributed constituent of the human organism, and that it is present in larger or smaller quantities in all the organs in which search has been made for it. Thus, it is found in the *corpus callosum* (dry) of the brain to the amount of 15.2 per cent.; in the entire brain substance, 2.34 per cent.; in the nerve tissues, 1.1 per cent.; but in the *nervus ischiadicus* (sciatic nerve), dry, 5.61 per cent.; in the human liver-gall (dry substance), 5.9 per cent.; in fat, about 0.35 per cent.; in muscle (dry), 0.23 per cent.; in human milk, 0.032 per cent. Similarly cholestrin is a constituent of the animal organism: In the *Erythrocyten* (dry) of the dog, 0.55 per cent.; in egg yolk, 0.44 per cent.; in the eggs of carp, 0.27 per cent.; in the sperm of Rhine salmon, 2.2 per cent.; in shark oil, 4.4 to 5.3 per cent., etc. It is present in the organism not only in the free state, but also in combination with the higher fatty acids (palmitic, stearic and oleic acids). The occurrence of such cholestrin esters was first demonstrated with certainty by Schulze in the wool fat of sheep, and subsequently by Liebreich and others in the epidermal organs of animals (hair, nails, feathers, hoofs, horns), in human blood, as well as in numerous pathological products. It has, furthermore, been demonstrated that, besides the “typical cholestrin,” a large number of isomeric cholestrins exist, such as the “ischolestrin” discovered by Schulze in wool fat, which, while distinct from the typical form, resemble it very closely. It is interesting also that plants, although they never contain the “typical cholestrin,” contain a peculiar form of cholestrin, which has been designated “phytosterin,” and that again the cholestrin-like bodies isolated from the lower fungi (ergosterin) differ both from phytosterin and from the cholestrins of the animal organisms.

It is here impracticable to describe the course and character of the experiments and speculations involved in the present study; it must suffice to record the conclusions reached by the author, as follows:

"Cholestrin has the composition,  $C_{27}H_{46}O$ . It is a monovalent, simply unsaturated, secondary alcohol, whose hydroxyl group is situated in a hydrided ring, between two methyl groups. The doppel binding is found in a terminal vinyl group ( $CH:CH_2$ ), in the  $\delta, \epsilon$  (or  $\epsilon, \delta$ ) position of the hydroxyl. The molecule of cholestrin contains one isopropyl group. From the number of hydrogen atoms it follows that, in total, four saturated hydrided rings are present in the cholestrin."

Cholestrin is in the above definitely characterized as a complex terpene. This is very interesting, because it is assigned to an exceptional position in the animal organism. Evidently it is not concerned in its chemical relations with the fats, the carbohydrates, and with the albumins and their products of change. Of all the substances present in the animal organism, it is the one containing the most complicated nucleus, only one other substance, cholic acid,  $C_{24}H_{40}O_6$ , bearing possibly close relation to it. The

*Physical Characters of Cholestrin* are described by the author as follows: It crystallizes from ether in fine anhydrous needles; from alcohol in transparent plates, containing 1 mol.  $H_2O$ . The vacuum-dry substance melts near  $148.5^\circ C.$ ; sp. gr., 1.046; optical activity,  $\alpha_D = -31.12^\circ$  (in ether solution). It is readily soluble in carbon disulphide, pyridin, chloroform (1:6.6), benzol and ether (1:3.9); more difficultly soluble in petroleum ether, alcohol and acetone; sparingly in glacial acetic acid; insoluble in water, even in presence of acids or alkalies, but a colloidal aqueous solution has recently been successfully prepared.—Arch. d. Pharm., 246 (1908), No. 2, 117-148.

*Cholestrin—Salicylic Acid Ester.*—L. Golodetz has obtained the salicylic acid ester of cholestrin ( $OH.C_6H_4.COO.C_{26}H_{43} = C_{33}H_{48}O_2$ ) by prolonged heating of 1 p. cholestrin and 2 p. salicylic acid at  $160^\circ-170^\circ C.$ , and washing the product with alcohol. When recrystallized from ether-alcohol, the ester forms large, white crystals, which melt at  $173^\circ C.$ , are very difficultly soluble in alcohol, but more readily in ether and chloroform. It is conjectured that this ester may eventually prove as important as a therapeutic agent.—Pharm. Ztg., liii (1908), No. 11, 110; from Chem. Ztg., 1907, No. 98.

*Cholestrin* is now prescribed by French practitioners as a general tonic in tuberculous affections, chlorosis and other ailments consequent on impoverished conditions of the blood, and particularly in such cases in which a codliver oil treatment has heretofore been recommended. It is given in daily doses of 1 to 2 Gm.—Pharm. Ztg., lii (1908), No. 44, 438; from L'Union pharm., 1908, No. 5.

*Cholestrin*, in form of subcutaneous injections, has been used with suc-

cess as a specific in tetanus of animals.—Pharm. Ztg., liii (1908), No. 35, 351; from E. Merck's Annual Rep., 1907.

*Gall-Stones—Identification.*—A. Steensma finds that the combustibility of chlorestrin affords the simplest test for the identification of gall-stones. These burn in the Bunsen flame with a vividity resembling fire works, while other pathological concretions do not possess this property. Further confirmation, if required, is obtained by simple tests for chlorestin and bilirubin, which are described in the author's original paper.—Pharm. Ztg., liii (1908), No. 11, 110; from Berl. Klin. Wschr., 1908, No. 4.

*Organotherapeutic Products.*—F. C. Koch communicates a paper on the subject of organotherapeutic products, with special reference to the standardization of thyroid preparations, in the "Proceedings" of this Association, 1907, 368-372.

*Diphtheria Antitoxin—Standardization*—W. A. Pearson interestingly reviews the subject of obtaining and standardizing diphtheria antitoxin, the importance of its proper preservation, and of keeping a supply ready for any emergency at all times.—Proc. Pa. Pharm. Assoc., 1907, 233-236.

*Synthetic Adrenalin.*—The progress made in the synthesis of adrenalin is the subject of a paper by Joseph L. Turner, in the "Proceedings" of this Association, 1907, 449-457.

*"Adrenine" (Adrenalin)—Reaction with Iron.*—A. Gunn and E. F. Harrison, in the course of some experiments with the active constituent of the suprarenal gland, which they designate by the name "adrenine," obtained a color reaction on adding some oleic acid to its solution. On investigation this reaction—greenish-brown, changing to violet-purple—was found to be due to the presence of iron as impurity in the *oleic acid*, which see under "fixed oils."

*Adrenine—Coloration of Its Solutions.*—A. Gunn and E. F. Harrison describe experiments undertaken to ascertain the cause and effect of the development of color in solutions of adrenine. The results lead to the following conclusions:

1. Adrenine may be dissolved in water with the aid of a smaller quantity of hydrochloric acid than one molecular equivalent.

2. Such a solution, even if kept out of contact with air, gradually acquires a red color.

3. Contact with alkaline glass and exposure to the air, considerably accelerate such coloration.

4. Exposure to light, or the presence of a minute amount of ferric salt, increases the coloration, but not very strongly.

5. A solution which does not readily discolor, even when exposed to light and air for some weeks, is obtained by using about 0.3 part of real hydrochloric acid to each part of adrenine, *i. e.*, about half as much again as one molecular equivalent. (To prepare such a solution, for 1 Gm. of

adrenine, 2.8 Cc. of the official dilute hydrochloric acid are required; or, very approximately, 3 minims for 1 grain.)

6. Discolored solutions show greatly reduced phy-iological activity, the reduction being, approximately, proportional to the degree of coloration.—Pharm. Journ., April 18, 1908, 513-514.

*Adrenine—Antagonistic Action of Choline.*—A. Desgrez and J. Chevalier find that choline is a complete neutralizing agent to adrenine; when the two substances are administered together by intravenous injection the adrenine is rendered inert. Choline has a marked depressant action on the arterial blood pressure, in fact, it is the only known body of definite chemical constitution and of physiological origin which so acts. When administered to dogs by intravenous injection in doses of 5 Mgm. per kilo, body-weight, it produces a transient fall in the arterial pressure equal to that of 5 Cm. of mercury. This is followed by a more prolonged fall, equal to about 2 Cm. of mercury, which persists for several hours.—Pharm. Journ., Feb. 1, 1908, 127; from Compt. rend., 146 (1908), 89.

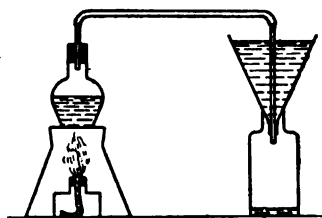
*Adrenine—Method of Testing Oily Preparations.*—A. Gunn and E. F. Harrison propose formulas for a number of oily preparations of adrenine (*Inhalant, Ointments, Suppositories*—which see under "Pharmacy"), which they describe as stable and elegant preparations containing the active constituent of the suprarenal gland in the proportion of 1 in 1000. They also propose a method for detecting adrenine in these oily preparations by the characteristic odor suggesting phosphoretted hydrogen which is developed when adrenine is treated with caustic soda (see Proceedings, 1907, 952), which is carried out as follows: Take from ten to twenty drops of the oil (or an equivalent amount of a solid preparation), dissolve in about ten times its volume of ether, and shake in a separatory funnel with ten to twenty drops of water acidified with hydrochloric acid; after separation, run off the aqueous layer into a small capsule or beaker, heat on the water-bath for a few minutes to remove ether and traces of odorous substances, then add six or eight drops of 10 per cent. solution of sodium hydroxide, cover with a watch-glass and set aside for four or five minutes. If adrenine was present, the liquid will then have a distinct peculiar odor suggesting phosphoretted hydrogen.—Pharm. Journ., Aug. 31, 1907, 310.

*Adrenine Antitoxine—Production from Rabbits.*—G. Ciuffo describes experiments made with a serum obtained by bleeding rabbits eighteen to thirty hours after partial removal (the greater part) of the suprarenal gland. At this stage the toxic symptoms due to the removal are at their height. Experiments made by taking two series of rabbits, as nearly alike as possible, and injecting into one series a sub-lethal dose of adrenine, and into the individuals of the other series first the anti-adrenine serum and then the same dose of adrenine as that given to the first series, showed

that the first series suffered from prostration, loss of weight, loss of appetite, lowering of temperature, glycosuria, etc., while the individuals of the second series remained unaffected by the injection. For this reason it is contended that the serum contains an adrenine antitoxin.—*Pharm. Journ.*, Febr. 15, 1908, 191; from *Arch. per le Sci. Med. Turin*, 31 (1907), 99.

*Urine—Gold Chloride a Reagent for Reducing Substances.*—C. J. Reichardt calls attention to the practical application of the property possessed by auric chloride to produce a characteristic reaction with the reducing substances present in urine, for which purpose Fehling's and Nylander's solutions are commonly employed. It possesses the advantage over these that it permits the recognition of reducing substances introduced into the urine by the medicaments administered to the patient, such, for example, as iodine or bromine compounds, or impurities introduced by insufficient cleansing of the vessel in which the urine is delivered. The proposed reagent consists of a 1 per cent. solution of gold and sodium chloride, of which 10 drops are added to about 3 Cc. of the urine, and the mixture is boiled. If, after repeated boiling, only an insignificant coloration results, followed after several hours' standing by the formation of a *flesh-colored* precipitate, the sample may be considered normal urine (free from pathological substances), containing no accidental impurities or substance introduced by medication. In such urine, Fehling's solution will produce no reaction; but urine which gives on boiling with Fehling's solution orange-red or yellow-red precipitates, will give when boiled with the gold-chloride reagent, after short standing, corresponding precipitates of a *dark-gray* or *inky black* color. The latter, however, are modified in their color if any of the impurities above mentioned (which are not recognizable by Fehling's solution) are present. The presence of iodide is indicated by the appearance of violet-red streaks before the beginning of ebullition, which increase in intensity and soon permeate the entire liquid; if bromide is also present, this is evidenced by a yellow flaky precipitate, produced immediately on adding the reagent; while if bromide alone is present, the urine assumes a faint yellow color, and the liquid becomes dark violet on boiling. The *flesh-colored* precipitate produced in normal urine is shown by experiment to consist of a creatine-gold chloride compound.—*Pharm. Ztg.*, liii (1908), No. 6, 58.

FIG. 75.



Apparatus for Detecting Acetone in Urine.

*Urine—Simple Method and Apparatus for Detecting the Presence of Acetone.*—

Lepinasse recommends the following simple method for the detection of acetone in urine, which is dependent on the well-known iodoform reac-

tion: A few cubic centimeters of distillate are collected by means of the little apparatus shown by Fig. 75, which is easily constructed from such material as is found in every laboratory, and the distillate is then tested for acetone by the iodoform reaction in the usual manner. As shown, an ordinary funnel serves as a condenser. This may be filled with cold water, or, during hot weather, with a refrigerating mixture. (Attention is here called to the apparatus because of its extreme simplicity and its possible applicability to other practical uses.—Rep.).—Pharm. Ztg., liii (1908), No. 38, 380; from Bull. Commerc., 1908, No. 3.

*Urine*.—New Reaction for Detecting the Presence of *Acetone*, which see under "Organic Acids."

*Urine—Estimation of Acetone*.—According to W. C. de Graaff acetone is estimated in urine as follows: 200 Cc. of the urine is reduced in volume by distillation to about 100 Cc., the distillate being collected in 50 Cc. of distilled water; on adding to this a solution of 0.4–0.5 Gm. of *p*-nitrophenylhydrazine in 10 Cc. of 30 per cent. acetic acid, a heavy flocculent precipitate of acetone-*p*-nitrophenylhydrazone is formed, which can be weighed after washing with water and drying at 105°–110° C. 0.193 Gm. of the hydrazone corresponds to 0.058 Gm. of acetone.—Pharm. Journ., Feb. 8, 1908, 151; from Pharm. Weekbl., 44 (1907), 555–561.

S. Moeller recommends essentially the same method for the estimation of acetone in urine, which was originally proposed by V. Eckenstein and Blanckisma.—Pharm. Ztg., liii (1908), No. 289; from D. Med. Ztg., 1908, No. 21.

*Urine—Volumetric Estimation of Albumen*.—Tsuchiya recommends a solution of 1.2 Gm. phosphotungstic acid and 5 Gm. conc. hydrochloric acid in 100 Gm. alcohol (96 per cent.) for the volumetric determination of albumen in urine. This reagent has the advantages over Esbach's reagent, that it gives no precipitate in normal urine, that the albumen, if present, is deposited with greater precision, and that it is more accurate—small quantities of albumen being precipitated quite as well as larger. Moreover, the precipitate contains approximately the same quantity of nitrogen as does the albumen in the urine, whereas the precipitate obtained with Esbach's reagent contains considerable uric acid.—Pharm. Ztg., liii (1908), No. 29, 289; from Centr.-Bl. inn. Med., 29 (1908), 105.

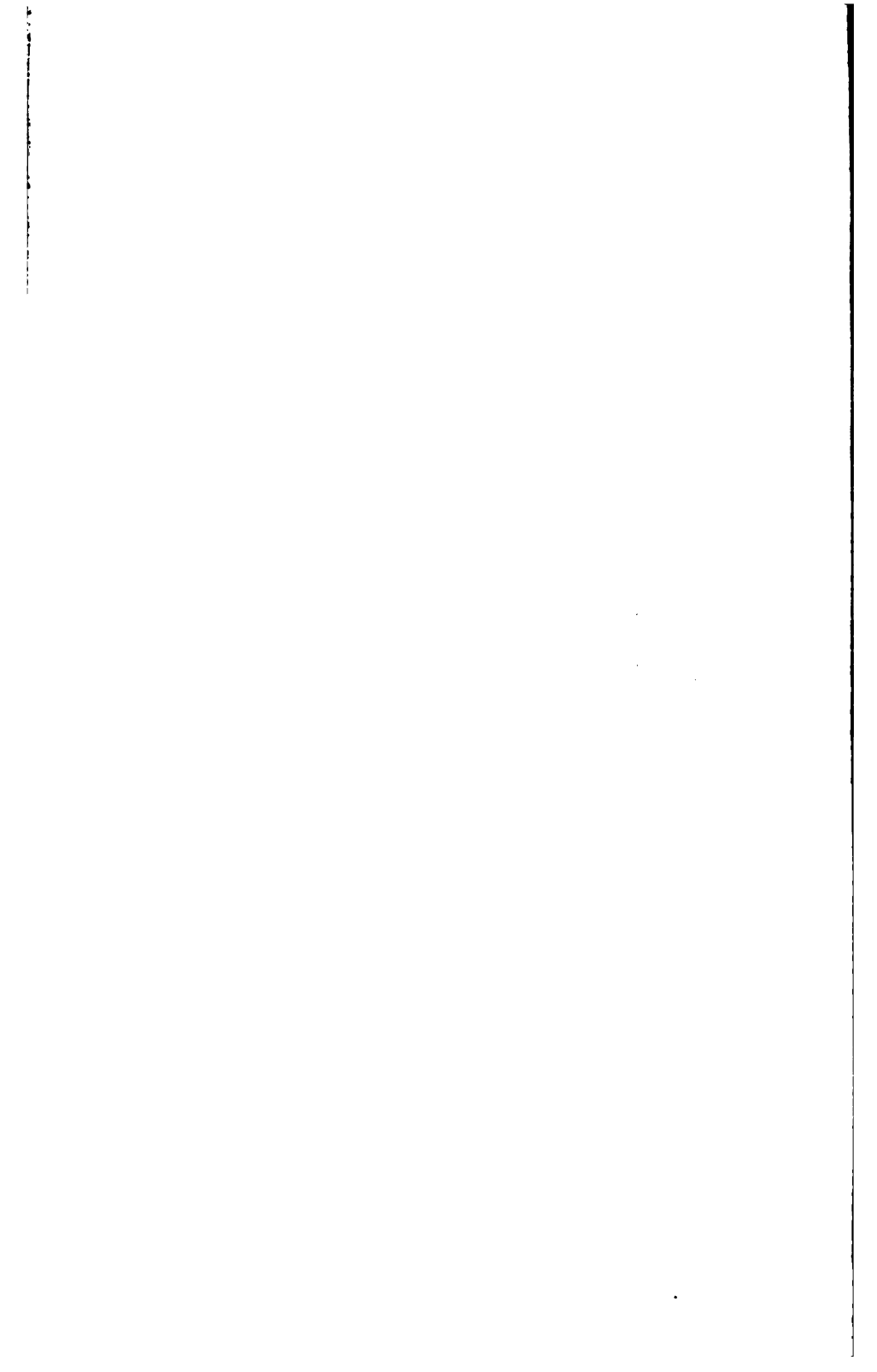
*Urine—Rapid Method of Detecting Albumen*.—The following reagent is recommended by R. Curso for the rapid and certain determination of albuminoid substances in urine, as well as for their differentiation: Ammonium molybdate, 1.0; tartaric acid, 4.0; distilled water, 40.0. If a precipitate is formed on the addition of the reagent of the urine, the mixture is heated. If the precipitate dissolves and then reappears on cooling, globuline or peptone is present; in the case of albumin, however, the pre-



cupitate does not dissolve.—Pharm. Journ., May 2, 1908, 572; from Gazet. Med. del Sud. Espan., through Rev. Pharm., March, 1908, 82.

*Urine—Impure Nitric Acid a Source of Error in Albumen Test.*—A. Stevenson observes that the assured purity of nitric acid in examination of urine for albumen by Heller's method is important. If, for example, the whitish ring is not produced on the line of contact of the layers of the acid and urine, but below (in the acid itself), the reaction may be attributed to metallic impurities in the acid, such as mercury, lead or even silver salts—the last named salt having occasionally been observed as an impurity in nitric acid.—Pharm. Ztg., lii (1908), No. 11, 110; from Berl. Klin. Wschr. 1908, No. 4.

*Urine.*—Some sources of error in the chemical examination of urine are noted by Joseph L. Mayer in a paper communicated to this Association, in "Proceedings," 1907, 485-490.



# MINUTES

OF THE

## FIFTY-SIXTH ANNUAL MEETING.

---

THE Fifty-Sixth Annual Meeting of the American Pharmaceutical Association was held at the famous health-resort of Hot Springs, Ark., beginning on Monday, September 7, 1908, and lasting throughout the week. The headquarters of the Association were at "The Arlington," but the various sessions were held at the "Hotel Eastman," about three blocks away, where there was a large assembly-room, used for the general and section sessions, as well as ample facilities for the sessions of the Council, Boards of Pharmacy, Conference of Pharmaceutical Faculties, etc. While the attendance was not as large as it has been at some of the meetings in the large population-centers of the country, the meeting was nevertheless enjoyable and profitable in a marked degree, and the healing waters and mild atmosphere of this great national sanatorium seemed to put the members in a particularly amiable frame of mind. The entertainment program was ample, and gave opportunity for more faithful attendance upon the various sessions, with its resulting advantages. The reputation of the Southland for genuine hospitality found delightful expression in the quiet but unbonded efforts of the pharmacists of Arkansas and neighboring States in general, and of Hot Springs, Little Rock and Poplar Bluff in particular, to leave nothing undone that would contribute to the pleasure and happiness of their guests or the success of the meeting. The goodly list of new members enrolled, something near the 300-mark, gave evidence of the continued healthy growth of the Association, and the increasing favor with which it is regarded by the pharmacists of America.

---

### FIRST SESSION—MONDAY AFTERNOON, SEPTEMBER 7, 1908.

The first general session was called to order at 3 : 30 P. M., by President William M. Searby, of San Francisco, who at once recognized Mr. Martin A. Eisele, of Hot Springs, Local Secretary for this meeting, who in turn, introduced Hon. W. H. Martin, of the local bar, saying he would welcome

the Association to the city of Hot Springs, in the absence of the mayor, who was expected to perform this pleasant office, but was unable to do so by reason of other engagements.

Mr. Martin thereupon proceeded to deliver an address of some ten or fifteen minutes' duration, cordially extending the glad hand of welcome on behalf of the municipality. His remarks were characterized by good humor and gentle raillery, with the druggists as the object of his wit; but Mr. Hynson, one of the Association's readiest speakers, squared this account a few moments later, with equal good humor and success.

Mr. Francis G. Schachleiter, of Hot Springs, President of the Arkansas Association of Pharmacists, extended a most hearty welcome on behalf of that association. He paid a glowing tribute to the great work of the American Pharmaceutical Association in the elevation of the practice of pharmacy.

At the request of the President, Mr. Henry P. Hynson, of Baltimore, replied with characteristic good temper to the address of welcome of Mr. Martin, and Mr. C. S. N. Hallberg, of Chicago, responded in his own inimitable style to that of Mr. Schachleiter.

The band here struck up "My Country, 'Tis of Thee," and, led by the President, the whole convention stood and joined in singing this patriotic air, and the great swell of voices made the moment quite impressive.

Local Secretary Eisele next introduced Miss Mary A. Fein—"twenty-four carats *fine*," he gallantly said—of Little Rock, Secretary of the Arkansas Association of Pharmacists since her girlhood, who came forward and presented to the President on behalf of the Arkansas Association a handsome floral token, consisting of fifty-six beautiful white roses, symbolic of the two-score years and sixteen of the Association's existence, in a brief but graceful little speech. She said that Scripture teaches us that a loving remembrance is like a precious ointment, ever carried about us, and she presented this gift of flowers as a faint expression of the sentiment of respect and devotion of the Arkansas druggists, and hoped it might again be her pleasure to extend the hand of welcome to this picturesque "valley of vapors," and fairly smother the Association with the perfume and petals of roses. (Great applause.)

On motion of Mr. George F. Payne, of Georgia, always noted for his gallantry, a unanimous rising vote of thanks was extended the fair sponsor for her splendid compliment to the President of the Association. President Searby likewise acknowledged the graceful courtesy in feeling and appropriate words, and thought it was an auspicious circumstance that the meeting should begin with a gift of roses, "the emblem of love," and expressed the hope that love would be the dominating influence during the meeting, to temper all differences of opinion that might arise.

The President announced the presence of Mr. Alrik Hammar as the accredited representative of the United States Navy to this meeting, and

invited him to address the Association. This gentleman had the distinction, he said, of being on the flag-ship "Olympia" with Dewey, at the battle of Manila Bay.

Mr. Hammar came from the Naval Tuberculosis Sanatorium at New Fort Lyon, Colo., and told of the good work being done there in the treatment of tuberculosis by injection of mercury. He also told of the effort of the Surgeon-General to advance the interests of pharmacists in the Navy by securing for them the grade of Chief Pharmacist, and of how he had finally succeeded in getting for hospital stewards an increase of compensation. The Bureau of Medicine and Surgery has also given official recognition to the profession of pharmacy by publishing in the "Naval Medical Bulletin," a section on the progress of pharmacy and chemistry, written jointly by a member of the medical corps and a pharmacist. He paid tribute to the unselfish work of this Association in assisting to create the grade of Pharmacist in the Navy, and hoped the steps already taken would lead to the establishment of the grade of Chief Pharmacist, which would carry with it a commission. He gave some details of the constitution of the hospital corps of the Navy, showing that there are some 25 pharmacists, with the rank of warrant officers, and from 250 to 270 hospital stewards, with the rank of chief petty officer, together with the necessary hospital apprentices, in that branch of the service, and spoke of the strict examination required for promotion. He closed with an expression of his personal appreciation of the good work done by this Association for the advancement of the interests of pharmacists in the Navy.

Mr. A. M. Roehrig, of the United States Public Health and Marine Hospital Service, stationed at Staten Island, N. Y., addressed the Association for the seventh time, as he said, as the representative of that arm of the Government service. He spoke of the mutual affection which had started at the fiftieth anniversary of this Association in Philadelphia, in 1902, when, for the first time, the Government was officially represented; which state of feeling has grown continuously since that time. He bore messages of friendly greeting and good will from Surgeon-General Wyman, and spoke of his abiding interest in the Association and his continuing desire to assist in every way in his power in the improvement and perfecting of the Pharmacopœia, a work in which he was particularly interested. He also referred to the Surgeon-General's better way of thinking of the status of pharmacists in his branch of the service, due to the unselfish efforts of this Association, and of his attempts to improve that status, not only as to compensation, but as to rank and grade, and particularly as to the establishment of the provision of waiting-orders for permanent disability. He told of the establishment of a tuberculosis sanatorium by the Public Health Service in New Mexico in 1898—an institution now treating some 300 patients—and of the wonderful results attained by way of apparently complete cure or arrest of progress of that dread

disease in many patients; also, of the recent establishment of a lepers' colony or hospital in the Territory of Hawaii, already finely equipped, to be followed by one in this country, to save the cost of transportation across the sea.

Mr. Lyman F. Kebler, Chief of the Drug Laboratory of the Department of Agriculture at Washington, addressed the Association as the representative of that branch of the service, and conveyed the kindly greetings of Dr. Harvey W. Wiley, Chief Chemist of the United States. He strongly disavowed the statement circulated in some quarters that the government was inclined to absorb or take over the Pharmacopœia. Nothing was further from the truth, as the government much preferred to have back of the Pharmacopœia and the National Formulary the great body of pharmacists and physicians of this country, numbering some 40,000 in the one case and 125,000 in the other, than to have the support of a few men only. He related some of the experiences of the government in dealing with parties putting upon the market worthless medicines or injurious drugs and chemicals.

The fraternal and cordial greetings of the National Association of Retail Druggists were extended by Mr. F. M. Apple, of Philadelphia, chairman of the delegation, to this body. Mr. Apple was particularly happy in his expressions of good will on behalf of the younger association, having to do with the practical business interests of the pharmacists of the country, towards the parent association, the American Pharmaceutical Association; expressed the highest respect and admiration for its praiseworthy principles so stoutly maintained for over half a century, and conveyed the best wishes of the N. A. R. D. for a prosperous and prolonged career. He said the N. A. R. D. had rendered important assistance in augmenting the membership of the A. Ph. A. by teaching the rank and file by practical demonstration the manifest and manifold advantages of organized effort. He deemed it an unquestioned fact that prosperous business conditions more incline the druggist to listen to the plea of higher pharmacy and the higher standards thereby implied: the underfed druggist, whose family is not properly clothed, is in no attitude to enthuse over higher ideals in pharmacy. The vital essential of education and high ideals is the possibility of giving practical application of the same to the serious business of life, and it has ever been the effort of the N. A. R. D. to demonstrate this possibility.

The work of the National Association of Retail Druggists in advancing the U. S. P. and National Formulary propaganda had succeeded in results beyond their fondest anticipations, but an apparent misconception of their activity in this behalf was a matter of regret. The position of the American Pharmaceutical Association as to the U. S. P. and N. F. has never been questioned by the N. A. R. D., in its parent influence over both these authorities and standard works; the National Association of Retail

Druggists had simply seized the psychological moment to place the pharmacists before the medical profession in their true light in this behalf, believing they could do this work with peculiar success, through their great organized body of pharmacists. They invited friendly criticism and advice, and hoped the delegation of this body to the forthcoming Atlantic City meeting of the N. A. R. D. on September 14th, would bear messages of counsel upon this subject.

He rejoiced in the increasing membership of the A. Ph. A., and the unquestioned evidences of a fruitful harvest from its efforts for better pharmacy, and expressed the hope that the fraternal relations existing between the two associations might never be impaired. (Applause).

Mr. Hynson, of Baltimore, explained that the article in the *Bulletin* for August, referred to by Mr. Apple, was aimed, not at the N. A. R. D., but at the attitude assumed by Mr. Koch, chairman of the propaganda committee of the Philadelphia Association of Retail Druggists, who had taken the position that this was peculiarly the work of the local associations, and not of the national associations, a position that this Association could not accede to. Mr. Apple said that he simply voiced the sentiment of the President of the National Association in this matter, and that this was not his own interpretation of the article in question.

Mr. W. L. Dewoody, of Pine Bluff, Ark., spoke as the accredited representative of the National Wholesale Druggists' Association. He said he had been delegated, with four other members of the N. W. D. A., residing in Arkansas, to present the cordial greetings of President Taylor and the Wholesale Association to this Association, and had hoped that some one of the delegation more accustomed to public speaking would be here to present the warm assurances of good will and hearty co-operation to this body, in the objects here sought to be accomplished. They were helped and strengthened, he said, by the researches of the American Pharmaceutical Association, and appreciated most fully the trade support and information given, which they were able to commercialize.

The Chair asked if there was a representative of the American Medical Association present, saying he had received a letter from Dr. Gorgas saying there would be a delegate from that body here to-day. Mr. John B. Bond, of Little Rock, stated that Dr. Stephenson, of his city, was chairman of that delegation, but had not as yet arrived, and asked that the matter be passed for the time being, and this was agreed to.

President Searby called First Vice-President Oscar Oldberg, of Chicago, to the chair while he read his Address, which here follows :

#### ADDRESS OF THE PRESIDENT.

*Members of the American Pharmaceutical Association.*

*Ladies and Gentlemen:* We meet to-day midway between the two great oceans. The men whose outlook is towards the rising sun, giving them visions of a glorious day, meet face to face with their brothers who gaze upon the setting sun, and see therein a fore-

cast of darkness and gloom. The American Pharmaceutical Association gladly welcomes the optimist, and earnestly strives to help the pessimist. Midway between the two she stands, an inspiration to the one, an encouragement to the other. Keenly sensible of the shortcomings of American pharmacy educationally, scientifically and ethically, she has ever stood for a broader education, higher scientific attainments and the purest ethics. Owing her very existence to an organized effort to obtain drugs of a better quality, she has consistently stood for over half a century for all that is best in pharmacy. And it is with no small degree of satisfaction that I can congratulate you that the work of the year that is just closing shows how earnest this Association is in its endeavors to live up to those high ideals which prompted its organization, adapting them to the conditions existing in our day. The proceedings of our local branches and the various Sections, as well as the contributions of our members to the pharmaceutical press, all show efforts toward educational, scientific and ethical betterment, and it will be our business at this session to consider how these objects may be best promoted in the year that is before us.

#### REORGANIZATION—MEMBERSHIP—LOCAL BRANCHES.

Notice was given by Mr. Henry P. Hynson at our last annual meeting of a number of amendments to our constitution and by-laws which will doubtless be considered in connection with the report of the Committee on Reorganization. There is a feeling on the part of many of our members that the work which the Association is aiming to do, and which increases with the growth in our membership, could be better effected by some modification of our methods of procedure. Two ideas on this subject represent in a general way the trend of thought among us. One is to eliminate from the proceedings of our annual meetings certain matters which belong to trade rather than to pharmacy and to reduce the social features to a minimum, thus leaving the Association free to devote its time almost exclusively to the reading and discussion of scientific papers. The other idea is substantially to secure through local organizations such an increase in membership as will cause the Association to more clearly represent the entire pharmaceutical body of the United States. Each of these ideas has much in it to commend it to favorable consideration. Of recent years many papers have received scanty notice at our meetings that would have furnished material for discussion, and the highest interests of our members would probably have been promoted by a freer comparison of ideas such as would have been evoked by a discussion of these papers. Indeed, the value of some papers consists almost as much in the discussions which they call forth as in the substance of the papers themselves. But while we need more time to discuss and digest the papers presented, we have to bear in mind, in laying our plans to accomplish this, that it is also of importance to largely increase our membership, and to see that nothing is done to lessen the interest of those druggists whose taste for purely scientific topics is not yet fully developed, lest by so doing we keep them outside of the Association.

There are probably 50,000 persons in the United States who are eligible for membership. Indeed, we should have this number, if, as has been hinted by an honored member, the American Pharmaceutical Association could

“embody every active member of a firm of wholesale druggists, every manufacturing pharmacist or chemist, every head of a department in a manufacturing chemical or wholesale drug establishment, every pharmaceutical chemist, every teacher in a pharmaceutical school, every teacher of chemistry, pharmacy, pharmacology or materia medica in a medical school, every owner and every editor of a pharmaceutical journal, every proprietor of a pharmacy, and in addition to all these, every registered clerk who is at all desirous of living up to the duties and the responsibilities that he has assumed by taking advantage of the protection and privileges given him by laws designed to regulate the practice of pharmacy.”



Another honored member has presented to us a captivating picture of

"a national association composed of state and territorial associations, which in turn are to be composed of district or county societies, all correlated and working with a definite aim."

Endeavoring to formulate some plan in my own mind whereby this latter idea might be ultimately realized, I came to the conclusion that it would be a gain if we had fewer organizations; if, in other words, the State Pharmaceutical Associations of which there are about forty-five, were all so constituted as to be parts of the American Pharmaceutical Association. This would not be possible under existing conditions of membership, both ours and theirs, but it might be possible to offer to the State Associations Associate Membership on their paying to this Association small annual dues of, perhaps, about \$2.00 a year for each member, this sum to entitle him to receive the *Bulletin*, and to take part in our annual meetings, but not to give the right to vote, or receive our annual volume of Proceedings. While there are difficulties in the way of such a plan, they may not be insuperable. A great benefit would accrue to both the State Associations and our body, as it would then be feasible to have local branches in every State; in fact, every State would practically be a local branch, and meetings could be held where it is now impossible. The *Bulletin* would soon become a magazine of great importance, and pharmacists would turn to it for the newest ideas in pharmacy.

My thoughts on this subject are confessedly crude, but the picture grows more rosy as I contemplate it, and the difficulties do not seem so insurmountable.

In studying the probable effect of plans for reorganization upon our membership, and considering the possibility of organizing local branches, I unexpectedly found some figures that almost startled me. Leaving out foreign and honorary members, I found that we had, at the date of the publication of the last volume of our Proceedings, about 2050 members. But when I tried to segregate these 2050 persons into possible district or even State societies as local branches, I found that it could not be done in many cases without throwing several States together, which would make the districts too large for practical work. Counting the Territories as States, there are three in which we have not a single member, Alaska, Nevada and Wyoming. There are three with one member each, South Carolina, New Mexico and Delaware; two with two; two with three; two with four; one with eight; one with nine, and one with ten. These fifteen States having thirty-seven members, had a population at the last census of 4,365,381. There are probably some States in which the membership is larger, where some such plan as I have referred to would be feasible, for instance, the District of Columbia, Pennsylvania, New Jersey, Rhode Island, New York, Illinois, Ohio, Massachusetts, Maryland, Missouri, Arkansas, and a few others. But so large a proportion of our membership would be unable to organize themselves into a local society, either by reason of the smallness of their numbers or the distances to be traveled in order to get together, that they would feel a degree of isolation they are not now conscious of, because they are now in touch with the parent organization as closely as are others, and under such local organizations they would not be.

#### MEMBERSHIP IN PROPORTION TO POPULATION.

Another matter which this investigation brought to my notice was the great difference between the proportion of members to population in the different States. Without wearying you with figures, I may mention a few States whose showing in the matter of membership is noteworthy. Of course, the District of Columbia stands at the head, with one member for each 5806 of population. Next comes Maryland with one for each 14,000. The third in the list was a surprise to me, and I think will be to you all, for it is my own State, the glorious State of California, the land of the setting sun, where the sun, as it sets every night, illumines the sky with the golden rays of hope and ambition

and courage. California has one member for each 22,500. Illinois comes next, with one in 22,960, but Pennsylvania, which has the largest number of members of any State, is ninth in the list, having one to every 25,934. The complete list is very interesting, and I think will furnish food for some vigorous thinking on our part. Probably the Committee on Membership may find it useful. In any event, I earnestly hope that the figures presented a year hence, will show a more general distribution of our membership.

Our membership is distributed over such a vast territory that it is unavoidable that some must feel a certain sense of remoteness from their fellow-members, and from most of the activities of the Association. This is doubtless an obstacle in the way of our growth in numbers. Those who can never attend its meetings, even though they would gladly do so, were it possible, cannot feel the same interest in the Association as those do who are privileged to enjoy its annual conventions with all the stimulus that comes from such gatherings. The establishment of local branches has most happily removed that drawback to many, but the large majority are still unaffected by this movement. By all means let this good work go on. Wherever there are a score, or even a dozen, progressive spirits in a locality, they should be encouraged to establish a local branch, holding frequent meetings. This step brings them in close touch with each other and with the whole work of the Association, and always results in important accessions to our membership. Thus the Association gains something, but the members in each locality gain more.

Leaving out those who never join with their fellows in any movement of this character, there is still a large number who ought to be interested, but who hold aloof. We should have at least 10,000 instead of less than 2,500. It is gratifying to know that our membership has steadily increased for several years, and as the work of the Association is better known and the proportion of pharmacists who are college graduates increases, the number may be expected to continue to grow for years to come. Nevertheless, the accessions by this method will be necessarily slow. Many persons have the impression that unless they are prepared to do research work, or write erudite papers, they are not wanted as members. This is a mistake. Much as we need that they should take an active part in our work and contribute of their experience and investigation for the benefit of others, we also need members that we may be of service to them. We want them as students in this post-graduate school of pharmacy, as ex-President Béal aptly termed it. By bringing them into touch with the Association's work and intensifying their interest in matters pharmaceutical, they cannot fail to be benefited to the extent, in some instances, of becoming investigators themselves. For such benefits as they may derive, they are asked to contribute only the amount of their annual dues, which is practically nothing, because the annual volume of our Proceedings, with the Report on the Progress of Pharmacy, is worth the entire amount of the dues. If we had 10,000 members we could provide more liberally for the expenses of our Sections and enlarge our publications. This view of the subject suggests that we should be very careful, lest in our plan of reorganization we should reduce our membership while trying to increase it.

#### STATUS OF PHARMACISTS.

Complaint is often made that pharmacists are not duly recognized as professional men. Those who make these complaints do not see themselves as others see them. A professional man is a person of culture and attainments, and only such are regarded as professionals. Looking over the great body of pharmacists in the United States, it is doubtful if that view would be entertained of them. The general public do not judge by the few, but by the many, and when they find a body of men endowed with only average culture and attainments they will hardly regard them as professionals. The man whose scholarship is gauged by a grammar-school diploma, and whose scientific attainments are measured by the average State Board of Pharmacy examination, cannot be

considered as either a scholar or a scientist. In general, a person's status represents what he is. He usually receives as much recognition as he is entitled to by reason of what he is, what he knows and what he does. Measured by this standard the 50,000 druggists in the United States, as a class, can hardly claim to be professional men, nor will they be so recognized as long as the majority of pharmacy graduates have only a grammar-school preliminary education, followed by a two years' course in a college of pharmacy, while thousands are being registered as licentiates in pharmacy without any college instruction, and still other thousands of drug clerks are confining their scientific studies to a vigorous cramming by teachers who are experts in the art of fooling the State Boards. Let us either stop clamoring for recognition as professional men, or elevate American pharmacy to the dignity of a profession by demanding appropriate scholarship and attainments.

Much as we wish to see the status of pharmacists elevated to that of a profession, we all recognize that this must be a gradual process and necessarily slow. The only difference of opinion among us is as to the way to attain our object. Shall we, seeking to do the greatest good to the greatest number, take into our drug stores, and afterwards into our schools of pharmacy, whatever material is offered, regardless of previous educational deficiencies, or shall we demand of them that they come to us with such preliminary education as is furnished practically free of cost in our secondary schools? The latter course will no doubt reach the smaller number. Which will in the end tend most toward our recognition as a profession? Which will do the most good to the individuals concerned and to the community?

#### PREREQUISITE LAWS.

The passing of State laws requiring candidates for examination for registration as licentiates to present a diploma from a college of pharmacy cannot fail to exert a notable influence upon the status of pharmacists. Up to the present time only three states, New York, Pennsylvania and Louisiana, have enacted this provision, but the thought is in the air, and it can hardly be doubted that other states will soon follow the example thus set. Ideally the law is a good one, and it is desirable that it should become general as rapidly as circumstances will allow. We have outgrown the apprenticeship system. It was good when carried out under ideal conditions, but those conditions were never general, and do not now exist. Furthermore, at its best, that system was inadequate to the needs of the present time, and drug-store experience now provides scarcely anything in its place. The "apprentice" is left to learn what he can pick up. There is practically no didactic instruction, no obligatory reading, no supervised experimenting. Hence the systematic instruction of the school of pharmacy has become a necessity. We must, however, recognize that the needed educational opportunities are not yet provided in some states for a prerequisite law, and therefore it would not now be feasible to enact such a law in every state; and even when such laws are enacted, exemption should be provided for those pharmacists of other states who had been registered before the date of the new law. Nevertheless, it is something to be aimed at until a prerequisite requirement is operative in every state. This would put pharmacy on the same footing in this respect as medicine and dentistry. Every argument that applies to these two professions applies to pharmacy. When all of the graduates of our colleges are fully competent to carry out the tests of the United States Pharmacopoeia, as now required by the pure food and drug laws, and when only graduated men can become registered pharmacists, we shall have taken a long step towards securing general recognition as a professional body.

#### PROFESSION—TRADE—ETHICS.

Now, pharmacy is a profession, and there are many engaged in it in this country whose right to be classed as professional men cannot be called in question. Some of

these have not had the benefit of high school and classical college courses, but have by study and effort "made good," and attained a degree of culture that entitles them to rank with those whose opportunities were greater. Why then, if many pharmacists are truly professional men, do the world at large not so recognize them as a body? Because of the other large number who are dragging us down by deficient culture, inferior scientific attainments and unethical practices. Occupying the dual position of professional men and merchants they have allowed the mercantile instinct to overbalance the professional, and unfortunately, in too many cases, have given prominence to a kind of trade that the public do not respect. The "patent" medicine business, in so far as it is boosted by misrepresentation, deception or untruthfulness in any way, and in so far as it is a cover for any form of vice or immorality, is now in disfavor, and justly so, not only with the medical profession, but with the intelligent public. Whether, therefore, we are proprietors or merely distributors of tabooed nostrums, or dealing in vice-producing drugs, we must divorce ourselves from the traffic in them, and disown those who do not live up to honorable ideals. It is my conviction that the status of pharmacists to-day is kept down more by the practice of druggists than by their deficiencies, whatever these may be, in educational and scientific attainment. These latter defects we are rapidly curing. Our colleges are demanding higher entrance requirements and giving more instruction. While they are moving in this direction too slowly to suit some of us, yet they are advancing, and thereby gradually improving our status. The desire among us is almost, if not quite, universal to improve the quality of our drugs and preparations. All this elevates our standing in the community. But we are sadly hindered in our aspirations for a higher status by the undue prominence given to trade, but particularly to that kind of trade that is not compatible with the highest ethics, and which the public are coming increasingly to condemn.

#### COMMERCIAL PHARMACY.

The battle between pharmacy as a business and as a profession is still being waged with ever-increasing intensity. In recent years commercialism has invaded pharmacy, apparently to the detriment of the latter. Many good pharmacists have found it hard to learn how to conduct their business in accordance with modern methods of trade. A great improvement has been made within the last decade, so that we now find most drug-stores well kept and well managed. The old fogies who never take stock, or who do not care about exact book-keeping, who have little or no system in any of the departments of their business, are rapidly giving way to more progressive men. We still, however, sometimes find a pharmacist who can balance a chemical equation, but cannot construct a balance sheet; who can detect a leak in his distilling apparatus, but cannot see the leaks in his business. Thanks to our pharmaceutical press, and to the attention now paid in our colleges to the business side of pharmacy, these matters are receiving more attention, and better methods are coming into vogue. When once the pharmacist applies to his business affairs the same intelligent supervision that he does to his professional, he soon learns to change his methods and adapt himself to twentieth-century conditions.

I have dwelt at length on the question of the status of pharmacists because I desire the best for pharmacy that can be obtained, but I am even more concerned that our trade interests should be duly conserved and advanced. It matters little what our status is if we cannot make a living. Most pharmacists are men of only small means. Single-handed they are at a disadvantage when competing with firms possessed of large capital. When cut rates prevail, they are the ones who suffer most. This, however, is one of those economic conditions to which we are rapidly adjusting ourselves, except that the large mail-order houses still get immense volumes of business that druggists, especially in the small towns, naturally expect to receive. The parcels-post scheme of Postmaster-

General Meyer was vigorously fought and ultimately defeated at the last session of Congress. But it will undoubtedly be brought forward again, and will need all the strength of a united opposition to prevent its passage. Should it become law, it will injuriously affect nearly all small druggists, only those in a large way of business, or doing a mail-order trade, profiting by it. Now is the time for the small dealer to fight for his proportion of business. Druggists cannot afford to lose almost their entire profit on a large part of their proprietaries, and also to let go a little here and a little there of their general trade.

#### PATENT MEDICINES AND FADS.

Another fly in the ointment is the hue and cry against druggists and drug medication that has been fostered by the exposure of the true nature of a limited number of patent medicines. Druggists have suffered in public esteem because they were the distributors of these nostrums, and were supposed to have some general knowledge of their composition. Accordingly the disciples of Mrs. Eddy, psychotherapy, osteopathy, and various other forms of drugless healing, have had their fling at doctors and druggists, certainly not to the advantage of either. In addition to this, many regular physicians have become so imbued with the newest fads in medical practice as to try to cure all the ills that flesh is heir to by the use of such agencies as sterilized food, sterilized drinks, and sterilized air, with the occasional use of the hypodermic needle and hypnotic suggestion. Serums, toxins, antitoxins and opsonins now hold sway, while old-fashioned and well-tried remedies whose action is understood, are discarded, because rational and scientific therapeutics have been neglected for nearly two decades. Surgery and serum therapy have for years engrossed the attention of the teachers in our medical schools, and as a result, their pupils are not well informed on the action of drugs and on the rational use of them in controlling and curing disease. Hence if they prescribe them at all they order some ready-made pharmaceutical which an enterprising detail man has made them believe is the only proper thing to use.

Now we have no controversy with serum therapy. The opsonic index is destined to render great service in diagnosis, and antitoxins are already proving their great value. Prayer cures and every form of psycho-therapy, supplemented by hygienic and sanitary living, may lessen the use of drugs, as do also moderation in eating and drinking, and temperate living in all things. But the craze for drugless therapy due to want of knowledge of the medicinal properties of drugs and of the intelligent mode of administering them is a menace to medical practice and to pharmacy. It is lessening the confidence of the public in physicians and their armamentaria. There are signs of improvement, however, in this matter. Physicians still find in their practice some use for drugs, and are inquiring into the best ways of employing them. They are tired of prescribing hand-me-downs, which their patients soon learn to call for without a prescription. Now that they are beginning to see how they have been promoting self-medication, the way has been opened for the approach of their friends the pharmacists, who are wisely inviting attention to the neglected pharmacopoeia and the elegant pharmaceuticals made in accordance with its formulas and those of the National Formulary.

#### PHARMACISTS AND PHYSICIANS.

A great advance has been made in many parts of the country in the movement for bringing physicians and pharmacists together. No more important work has been undertaken by the American Pharmaceutical Association in recent years than this. That it is of the greatest benefit to both cannot be questioned, for both are interested in discouraging self-medication. Doctors are usually glad to confine their prescribing to preparations made by published formulas, when shown in a courteous manner how they can do so, provided they can also be shown that the articles thus made are of equal re-

liability with advertised specialties, equally elegant in appearance, taste and all other qualities likely to appeal to a patient. No effort should be spared on our part to make medicines as palatable as possible, as attractive to the eye and in every other way as the best skill can make them without sacrificing any of their remedial value. It is not to be expected that physicians will at once change their habits. Persistent, patient, good-natured efforts have to be made to bring this about. But it can be done, and is being done, to an extent that justifies the time and energy put into the work.

#### MANUFACTURING PHARMACISTS.

While I urge very strongly the pushing of the preparations of the United States Pharmacopœia and National Formulary in place of those possibly of equal merit but made by unknown formulas marketed by manufacturing houses, I yet see a place for these firms in the economy of our time. There will always be some processes that can be better carried out in a factory, where every possible advantage of machinery, specially trained and minutely organized labor, and all the appliances of the latest scientific knowledge and engineering skill are at hand. These firms have done pharmacy a service in manufacturing more elegant and otherwise acceptable products than were common before their advent. They have taught us to pay more attention to the appearance and style of our goods. And in these days of revulsion against crude physic no pharmacist can afford to be indifferent to elegance in medicine. If he cannot make reasonably palatable and otherwise agreeable medicines himself, let him buy them or hire somebody to make them for him. The manufacturer, the jobber and the retailer are essential to each other. Only it is our business to see that the big dogs don't get away with all the meat and leave us smaller fellows only the bone.

#### PHARMACISTS IN THE GOVERNMENT SERVICE

I have to again call your attention to the unsatisfactory position of pharmacists in the service of the United States government. Most of the medicine used in the army is dispensed by enlisted men without pharmaceutical qualifications. While the federal government has taken radical action to prevent injury by the use of adulterated drugs and foods, by interstate legislation, and nearly all the states have enacted laws of similar import, and also to prevent the dispensing of drugs and medicines to the most useless citizens by ignorant or incompetent persons, the men in our army, who have placed their health and their lives at the service of their country have no such protection, but are required to accept their medicines at the hands of unqualified dispensers. The pharmacists, properly so called, in the navy, number only twenty-five, and are all employed at shore stations. In the Public Health and Marine Hospital Service the pharmacists are subject to many kinds of duty, exposed to sickness from quarantine and other causes, are liable to be moved from pillar to post, away from social advantages, and in addition to their pharmaceutical work, discharge practically the duties of executive officers at their respective stations. They are required to be pharmacists, book-keepers, engineers and generally men of affairs. Their duties are multifarious and arduous, calling for professional, technical and executive ability of a high order, yet their salaries are small in comparison with that of the other officers. Besides all this, their rank, as well as that of the pharmacists in the army and navy, is unsatisfactory. Unlike physicians, none of these pharmacists are commissioned officers. Although the pharmacists in the Public Health and Marine Hospital Service must be graduates in pharmacy, and pass the United States civil service examination, they are appointed by the Secretary of the Treasury upon the recommendation of the Surgeon General. Strenuous efforts have been made during the past year by your Committee on the Status of Pharmacists in the Government Service and by a similar committee of the National Association of Retail Druggists to secure the passage of three bills to remedy these evils.

one affecting the army, the other the navy, and the third the Public Health and Marine Hospital Service. There is reason to believe that these bills may be passed by Congress at its forthcoming meeting next December. In particular, efforts should be made to secure the passage of the bill relating to the Public Health and Marine Hospital Service, known in the last Congress as the H. R. 18794, which would probably have been passed but for want of time after it had been considered in committee. We owe it to our brother pharmacists in all these branches of the government service to give some serious attention to their case, and I hope that our members in every state will take the trouble to press a consideration of this subject upon their senators and congressmen, as a means of securing better recognition for the profession of pharmacy in general.

#### LEGISLATION AFFECTING PHARMACISTS.

The intrinsic value of the federal Pure Food and Drug Law has been so generally felt in its operation upon interstate commerce that many states have enacted laws of similar tenor. Pharmacy laws, poison laws, and anti-narcotic laws have been passed, so that now there is a danger of too many rather than too few laws. In addition to all these, pharmacists are having no little difficulty in complying with the interpretation of the federal act as promulgated by the Department of Agriculture under the general title of Food Inspection Decisions. As these decisions have all the force of law until upset by a court of law, which few persons care to seek, it is seen that pharmacists are hedged in on all sides by legal restrictions, which in many cases have been vexatious as well as expensive, due often to haste or want of practical knowledge on the part of those in authority. These laws, I believe, are being lived up to by druggists uncomplainingly, though few, so far as my observation goes, have been guilty of such a solecism as to print on their sugar-coated tablets of codeine and morphine, how much of the alkaloid is contained in an avoirdupois ounce, which is what the department requires. It seems as if it might be well for us to concentrate our efforts for the present on the faithful carrying-out of the laws already in force; for notwithstanding some defects due to hasty legislation, they are among the best that have ever been enacted, and are destined to work a revolution in favor of truth and honesty.

#### THE BULLETIN.

The publication of the Association's monthly *Bulletin* is no longer an experiment. It informs us as to the work going on in different centers by the local branches, and keeps us acquainted with the proceedings of the Council. In any reorganization that may be adopted it is likely that it will be more than ever needful to keep our members in touch with the work of the Council. As the local branches increase in numbers, this organ will be more and more a record of the work of the Association and an expression of its life, and hence the need of such a publication will be increasingly felt. Provision should be made to sustain it by the appropriation of sufficient funds to publish it in a style worthy of its parentage.

#### THE ENDOWMENT FUND.

At our annual meeting in 1906 it was proposed to create an endowment fund for the purpose of enabling the Association to tide over any periods of adversity, which in the vicissitudes of human affairs may come to any institution. The gentlemen who suggested this action were two honored officers of the Association, Treasurer S. A. D. Sheppard and ex-President James H. Beal, and accompanying the proposal was an offer to supplement such donations as might be made to this fund by a contribution from themselves of five per cent. of the amount contributed until the sum of \$25,000 was reached. Encouraged by this noble offer, our hearts were gladdened a year ago by a number of contributions aggregating somewhere near \$1,500. It is important that this matter should not be allowed to slumber too long, for the offer of these friends remains good only for

a limited time. While that time is limited only by the length of their lives we all know that that is a fixed limit. I suggest, therefore, that a committee be appointed to obtain additions to this fund, as opportunities may arise for presenting the claims of the Association upon its friends.

In conclusion, the American Pharmaceutical Association has reason to celebrate its fifty-sixth anniversary in a cheery mood, because it has made substantial advances during the past year. Its membership roll is higher than ever before, and gives promise of further growth. Its activities have been greater, benefiting a larger number, as its local branches have brought the pharmacists of new localities more immediately within the sphere of its influence. This beneficent work is in its infancy, for the number of these branches is sure to increase. The cause of pharmacy is to be congratulated in the fact that the desire to obtain better drugs and pharmaceuticals is well-nigh universal in this great land, and that the Pure Drug Laws, now so numerous, are but the enactment into legal statutes of the long-cherished desire that gave birth to this Association. Again, the success of the "get together" movement wherever it has been seriously tried, encourages the belief that pharmacists and physicians have passed their apogee, and that the perigee of mutual co-operation for mutual good is coming, let us hope, with a comet-like swiftness. And while physicians are breaking away from prescribing proprietaries, druggists are also manifesting a more healthy sentiment on the subject of patent medicines. One movement helps the other. It is true that in certain parts of the West and Middle West some druggists do still permit displays of nostrums in their store windows thereby giving tacit endorsement to questionable remedies. Yet the tendency is to discourage their sale and to encourage sane medication under medical advice. Shorter hours of business in drug-stores, and especially on Sundays, are being adopted in many towns, and the movement will surely grow. These steps towards ethical and social improvement, together with the general endorsement of the "tell-the-truth" policy in regard to labels and advertisements, operating concurrently with the general advance in educational requirements by colleges and boards of pharmacy, and with the increase of pre-requisite state laws—these things are all conducing to an elevation of the status of the pharmacist, and will in due time tend to his securing better compensation.

So as I close this address, I ask you to turn your faces toward the rising sun; feast your eyes on visions of a brighter day, towards which we are all working, as we seek to promote true pharmacy by education, by legislation, and by steady, persistent efforts to develop a scientific, practical and ethical pharmacy.

The President's Address was heartily applauded.

On motion of Mr. H. M. Whelpley, seconded by M. F. W. Meissner, Jr., the Address was received, and the Chair directed to appoint a committee of five, to consider and report on the recommendations made at a later session. The Chair appointed on this committee Messrs. Joseph W. Eng-land, of Philadelphia; William Mittelbach, of Boonville, Mo.; Charles W. Johnson, of Seattle, Wash.; John B. Bond, of Little Rock, Ark., and H. V. Army, of Cleveland.

Vice-President Oldberg continued to occupy the chair for the time being, at request of the President.

The General Secretary read the following telegram received by President Searby from Cuba, and signed by sixteen members of the Association in that young Republic:



HAVANA, CUBA, *September, 7, 1908.*

WM. M. SEARBY, *Hotel Arlington, Hot Springs, Ark.*

Cuban members of the A. Ph. A. send their greetings to the Association and wish much happiness to all of its members.

(Signed): Garcia, Morales, Biosca, Fernandez, Abreu, Alacàn, Johnson, Moya, Diaz, Martinez, Ramirez, Cartaya, Figueroa, Herrera, Bosque, Padron, and others.

The Secretary also read the following message of greeting from the Philippines, conveyed in a letter addressed to Treasurer S. A. D. Sheppard under date of August 12th, and signed by a pharmacist attached to the Philippine Division of the U. S. Army :

Greetings from the Philippines and the Army Pharmacists over here, who wish to be remembered in the next meeting of the A. Ph. A., and I should be pleased to have you undertake to deliver these greetings, at the next meeting of the A. Ph. A. in our and my behalf and have them recorded in the Proceedings next issue as a stimulus for future endeavor amongst us and encouragement for membership by the Army pharmacists in the Association in general.

Yours fraternally,

H. W. RIESS.

On motion of Mr. Hallberg, of Chicago, the Secretary was requested to acknowledge the greetings from Cuba and the Philippines.

Mr. Whelpley, of St. Louis, offered the following resolution, which, on motion of Mr. Hynson, was adopted by a unanimous rising vote :

It is moved by James H. Beal and seconded by H. M. Whelpley that the General Secretary be instructed to send a telegram of greeting from the American Pharmaceutical Association to Treasurer Samuel A. D. Sheppard, and to express our regret at his inability to be present with us to-day.

The Secretary took this occasion to bring to the notice of the Association a letter received from Mr. Sheppard, expressing his deep regret and sense of pain on not being able to attend this meeting, and at the same time enclosing his check for \$1,000 for the Endowment Fund of the Association.

The Secretary also read the following letter from the retiring Treasurer, addressed to President Searby and to the members of the Association jointly :

BOSTON, *September 2, 1908.*

PROF. WILLIAM M. SEARBY, *President of the American Pharmaceutical Association, Hot Springs, Arkansas.*

*Dear Mr. President, also Fellow Members:* The enclosed peremptory letter from my physician tells why I am not with you at Hot Springs. He will not let me go. To say that I regret not being there does not express my feelings. Indeed words cannot express them. I have looked forward to this meeting with more than ordinary interest; especially for two reasons, first it is the last meeting at which I should act as Treasurer and second the question of re-organization is under consideration.

It is not necessary for me to repeat what I have said, that I cannot again accept the position of Treasurer, but I do so *with emphasis* in order that there may be no uncertainty in the minds of my many friends on this point.

Now as to re-organization; as I cannot be with you to talk it over will you allow me to write a few words: progress is always in order, but it should be *evolution* and not *revolution*.

Our Association has had a remarkable history for usefulness under its past and present organization, hence the past and present organization must have been and is reasonably good. I have thought of this subject very intensely for a long time and my present position is not that of an enthusiast but, rather, that of a conservative yet deep and strong lover of the Association. I cannot do better than to quote from a letter on the subject, written by one of our most well-balanced and strongest members, who writes as follows: "My advice would be to make the changes gradually, step by step, and not to leave a sound basis until we felt the new ground firmly under our feet. So far as I have come to any conclusion, it is this: that after all of the new changes proposed have been presented and discussed, so as to bring out their various strong and weak features, they should be referred to a strong committee with instructions to elaborate them and weld them together in one plan, and to report their findings to the Council for further discussion and action." I would also refer, with favorable comment, to President Searby's letter on this subject; printed in the *Pharmaceutical Era* and afterwards in the *Pacific Pharmacist*.

I also bespeak the attention of the Association to a subject in which Mr. Alrik Hammar is interested. Mr. Hammar will be at the meeting as a delegate from the Navy. He has been an enthusiastic member of the Association for eleven years, but this is his first opportunity to attend a meeting. He was the pharmacist on Admiral Dewey's flagship "Olympia" at the battle of Manila.

With warmest regards for each officer and member of our Grand Old Association,

Yours most sincerely,

S. A. D. SHEPPARD.

The Secretary also read in this connection a communication from Dr. Hill, of Boston, Mr. Sheppard's physician, peremptorily forbidding him from making the trip to Hot Springs, on account of his unstable state of health.

Mr. Hynson moved that the Secretary be instructed to have an abstract made of so much of Mr. Sheppard's letter as relates to reorganization, and that that abstract be referred to the Committee on Reorganization. This motion was seconded by Mr. Whelpley and adopted.

The Secretary read certain proposed amendments to the By-Laws offered by Mr. Hynson, which, under the rule, must lie over until the next session. One, to amend Article III, Chapter VII, relating to Council, by inserting the words "Editor of the *Bulletin*" after the words "Reporter on the Progress of Pharmacy," the intent being to make the editor of the *Bulletin* an *ex-officio* member of the Council; the other to add a new clause to Article VII, authorizing the Council, after the publication of each edition of the National Formulary, to appoint a committee of fifteen from the general membership of the Association, to have charge of the revision of the Formulary, said committee to report annually, etc.

Mr. Whelpley read the following autographic letter from the Honorary President of the Association, Mr. Philip C. Candidus, of Mobile:

I regret very much my inability to be present and thank the Association in person for

the high honor bestowed on me last year. I was in hopes I would be able to attend the meeting this time, but am too weak to make the trip, especially as it calls for two changes of cars. For a few years past the meetings have not been as interesting to me as previously, on account of the death of such old and dear friends as Maisch, Sloan and others. I realize that I must soon follow them. Seventy-seven years do not expect much in the future, and happy is the man who can say when his time comes, "I have done my duty to my fellow-men as well as I knew how."

Give my kindest regards to my Association friends, and I wish the Association a rousing and profitable meeting. I am

Yours truly,

P. C. CANDIDUS.

This letter was greeted with applause by the members.

Mr. J. L. Lemberger thought this communication from this old and honored member of the Association should not be passed by in silence, and moved that the Secretary make suitable acknowledgement by letter, and that the communication be spread upon the minutes of the Association. This motion was seconded by Mr. Leo Eliel, of South Bend, Ind., and carried.

The Chair announced that the reading of the minutes of the Council was the next order of business, and called on Secretary Whelpley, of that body, to present them. Mr. Whelpley thereupon gave a verbal abstract of the minutes of the third session of the Council, held this day, as the full minutes covered some 47 pages and the hour was late :

#### THIRD SESSION OF THE COUNCIL, SEPTEMBER 7, 1908.

Council called to order at Arlington Hotel, Hot Springs, Ark., at 10:30 a. m., by Chairman J. H. Beal, with the following members present: Apple, Beal, Caspari, Jr., Diehl, Eberle, Eisele, Eliel, England, Godbold, Keith, Lemberger, Oldberg, Roehrig, Searby, Whelpley, Wilbert.

Secretary H. M. Whelpley presented the following synopsis of the correspondence of the Council since the second session held at New York City, September 7, 1907.

#### *Council Letter No. 1—St. Louis, October 4, 1907.*

*Ebert Memorial Volume*—Whereas it has been agreed that the Veteran Druggists' Association Fund take care of the postage upon said volume, amounting to \$125.00, it is moved by J. H. Beal, seconded by H. M. Whelpley, that said offer be accepted with thanks, and that Chairman C. S. N. Hallberg be instructed to proceed accordingly.

Motion carried.

Local Secretary Martin A. Eisele was made chairman of the Local Committee of Arrangements for the 1908 meeting and requested to name his own associates on the committee.

Four hundred reprints of the report of the secretary of the Section on Education and Legislation were ordered for the use of the officers of that Section.

Applicants for membership. Nos. 1 to 9 were elected.

#### *Council Letter No. 2—St. Louis, October 19, 1907.*

It is moved by H. M. Whelpley, and seconded by Otto F. Claus that the following request of the Committee on Ebert Memorial Volume be granted :

"The Committee on Ebert Memorial Volume, appreciating that the Association has assumed the cost of the publication, and the C. D. V. A. having assumed the cost of

mailing the volume to the entire membership, amounting to about \$120.00, ask that the Council authorize the Committee to furnish the Ebert Memorial Volume to such non-members as subscribe \$1.00 or more to the Ebert Memorial Fund.

On being advised that the favor is granted the committee will announce in the various pharmaceutical journals that to all who subscribe \$1.00 or more within thirty or sixty days, a copy of the book will be sent free.

Enclosed with such volume will be a circular and application blank for membership in the Association.

Chicago, October 12, 1907. For the Committee: C. S. N. Hallberg, Chairman,  
Motion carried.

Applicants for memberships Nos. 10 to 14 were elected.

*Council Letter No. 3—St. Louis, November 7, 1907.*

*Council Committees:* Chairman Beal submitted the following for approval of the Council:

*Membership*—A. M. Roehrig, J. P. Remington, Oscar Oldberg, I. A. Keith, H. M. Whelpley (Secretary), Charles Caspari, Jr. (*ex-officio*), S. A. D. Sheppard (*ex-officio*), J. W. England, Jacob Diner, F. M. Apple.

*Finance*—Joseph L. Lemberger, Otto Claus, Leo Eliel.

*Publication*—Charles Caspari, Jr., C. Lewis Diehl, H. M. Whelpley, M. I. Wilbert, Virgil Coblentz.

*Centennial Fund*—Wm. H. Searby, Joseph Lemberger, Charles Caspari, Jr.

*Auditing Committee*—Louis Emanuel, J. A. Koch, W. E. Rodemoyer.

*Transportation*—Charles Caspari, Jr., C. S. N. Hallberg, Caswell A. Mayo, Charles G. Merrell, S. A. D. Sheppard, H. M. Whelpley, Wm. Searby, Frederick J. Wulling, Charles M. Ford, Philip Asher, W. S. Elkins, Jr.

The appointments were approved.

*Prize Certificates.*—Moved by S. A. D. Sheppard and seconded by H. M. Whelpley, that colleges or professors giving membership in the American Pharmaceutical Association as a prize to deserving students, be furnished, at the nominal cost of one dollar, one of the regular paper certificates of the Association properly filled out: also one of the blank-letter forms gotten up for that purpose.

Motion carried.

Applicants for membership Nos. 15 to 19 were duly elected.

*Council Letter No. 4—St. Louis, December 20, 1907.*

The sum of twelve hundred dollars was appropriated to cover the expense of the Bulletin for the balance of the fiscal year.

Applicants for membership, Nos. 20 to 42 were duly elected.

*Council Letter No. 5—St. Louis, February 4, 1908.*

*The Local Committee of Arrangements* for the 1908 meeting was announced by Chairman M. A. Eisele, as follows:

Frank Schachleiter, Hot Springs; Henry Weimar, Hot Springs; Charles Schneck, Hot Springs; R. G. Norris, Hot Springs; E. F. Klein, Hot Springs; A. C. Jennings, Hot Springs; F. W. McClerkin, Little Rock; J. F. Dowdy, Little Rock; L. K. Snodgrass, Little Rock; J. A. Ginocchio, Little Rock; A. W. Stahel, Little Rock; W. L. Dewoody, Pine Bluff; W. R. Appleton, Warren; J. W. Morton, Ft. Smith; Henry Bordeaux, Dermott.

*Reduced Price of General Index*—It is moved by M. I. Wilbert and seconded by Franklin N. Apple that five hundred copies of the General Index to the Proceedings of the A. Ph. A. be offered (to members in good standing) at the reduced price of two dollars a volume.

The following is self-explanatory: "Resolved that the Philadelphia Branch of the American Pharmaceutical Association recommend that a key to the volume number of the earlier volumes of the proceedings be printed and inserted in the volumes of the General Index and that the price of the Index be reduced to two dollars per volume."

Motion carried.

*Abstract of Criticisms of the N. F.*—Having very carefully collected and systematically arranged for the use of the Committee on N. F., brief extracts of the criticisms and suggestions for the betterment of the N. F. and its preparations that have appeared in the journals up to date, and finding this list too voluminous for manifolding on the typewriter economically, I move, as chairman of the Committee on N. F., that this collection of abstracts be published in the Bulletin as soon as practicable, that the editor be requested to have it set up in type, anticipating such publication, and that he furnish the Committee, for its immediate use, with a sufficient number of advance copies of the same.

I believe this publication to be in harmony with the report of the Committee, accepted at the annual meeting, and, moreover, to be of sufficient interest to the members generally to warrant its publication.

In order to bring the motion properly before the Council, the secretary of the Council seconds the motion of C. Lewis Diehl, chairman of the Committee on N. F.

Motion carried.

*Auxiliary Committee on N. F.* It is moved by C. Lewis Diehl and seconded by H. M. Whelpley in accordance with the plan recommended in the report of the committee on N. F. that the committees be authorized to nominate from the membership at large an auxiliary committee, consisting of not less than ten members, to serve on various sub-committees of the N. F. Committee, such nominations to be subject to confirmation of the Council when submitted by the chairman.

Motion carried.

Applicants for membership Nos. 43 to 59 were elected.

*Council Letter No. 6—St. Louis, February 22, 1908.*

Applicants for membership Nos. 60 to 70 were elected.

*Council Letter No. 7—St. Louis, March 9, 1908.*

*Auxiliary Committee on N. F.* C. Lewis Diehl submitted the following names of members of the Association at Large, nominated by the chairman of the several sub-committees to serve as an auxiliary committee on National Formulary:

Henry V. Arny, 356 Superior St., Cleveland, Ohio; George M. Beringer, 501 Federal St., Camden, N. J.; E. Fullerton Cook, 145 N. Tenth St., Philadelphia, Pa.; H. A. B. Dunning, 423 N. Charles St., Baltimore, Md.; Leo Eliel, 230 Washington St., South Bend, Ind.; Joseph W. England, 35 Poplar St., Philadelphia, Pa.; William A. Hall, 177 Griswold St., Detroit, Mich.; Wilbur L. Scoville, care Parke, Davis & Co., Detroit, Mich.; Leonard A. Seltzer, Room 6, 32 Adams Ave., W., Detroit, Mich.; M. I. Wilbert, 2811 Diamond St., Philadelphia, Pa.

The names were approved and the sub-committees of the Committee on National Formulary constituted as follows:

Sub-Committee I. On Criticisms of Formulas; Diehl, Hallberg and La Wall.

Sub-Committee II. On Corrections of Formulas; Stevens, Hall and Seltzer.

Sub-Committee III. On Additions to Formulary; Hallberg, Eliel and Arny.

Sub-Committee IV. On Collection of Working Formulas; La Wall, Beringer, E. F. Cook, England and Wilbert.

Sub-Committee V. On Construction of Formulas; Hynson, Dunning and Scoville.

Moved by J. H. Beal, seconded by S. A. D. Sheppard, that the Council of the American

Pharmaceutical Association, on behalf of said Association, hereby tenders its thanks to the Committee of Arrangements of the New York Meeting and to the Local Secretary, Thomas P. Cook, for the generous contribution of the residue of the entertainment fund amounting to \$1,380.00, to the Endowment Fund of the Association, and that thanks are also tendered to all the contributors to the said Entertainment Fund.

That the Secretary of the Council be instructed to forward a copy of the above resolution to Mr. Thomas P. Cook, and also the same to be published in the "Bulletin."

Motion carried.

Applicants for membership Nos. 71 to 76 were elected.

*Council Letter No. 8—St. Louis, April 7, 1908.*

An additional sum of sixty dollars was appropriated for certificates, to provide for change of the original plate and the printing of extra certificates with wide margin for use as prizes.

George C. Bartell offered his resignation as active member of the Association, having joined in 1881. His name was ordered placed on the list of life members, old style, without the Proceedings.

Applicants for membership Nos. 76 to 79 were elected.

*Council Letter No. 9—St. Louis, May 15, 1908.*

*First International Congress for the Repression of the Adulteration of Alimentary and Pharmaceutical Products.* Chairman Beal has appointed a committee consisting of H. M. Whelpley, Chairman, Charles Caspari, Jr., and Edward Kremers, to report to the Council at as early a date as practicable on the propriety of the A. Ph. A.'s uniting as a nominal member with the above congress.

The committee made a favorable report, and the nominal membership was completed.

On motion by Chas. Caspari, Jr., seconded by S. A. D. Sheppard, an additional sum of \$600.00 was appropriated for account of Proceedings for the current fiscal year.

The Treasurer's report for last year showed an unexpended balance of \$216.00 from an appropriation of \$3000.00, and the total appropriation for the present year, including the above addition, amounts to \$4100.00. As our membership increases from year to year, the annual expenses for proceedings will naturally increase.

Applicants for membership Nos. 80 to 113 were duly elected.

*Council Letter No. 10—St. Louis, June 4, 1908.*

Applicants for membership Nos. 114 to 128 were elected.

*Council Letter No. 11—St. Louis, June 30, 1908.*

Permission was granted to the National Association of Retail Druggists to use, free of charge, abstracts of certain formulas of preparations found in the National Formulary in the booklet entitled, "Some U. S. P. and N. F. Preparations," upon condition that said Association recognize the A. Ph. A. copyright by inserting in future issues of said booklet the statement that such permission has been received from the Council of the American Pharmaceutical Association.

*Council Letter No. 12—St. Louis, July 15, 1908.*

Bernard Fantus, M. D., was granted permission on payment of \$5.00 to use portions of the text of the National Formulary in the Epitome of National Formulary for Physicians' Use to be added to the text-book on Prescription Writing and Pharmacy by Bernard Fantus, the same to be used in accordance with the rules of the Council and the following proposed text from a specimen page.

*Acetum Aromaticum.* Aromatic vinegar. Of same strength as, but more elegant than dilute acetic acid by reason of the presence of a mixture of aromatic oils.

Action: Antiseptic.

Uses: Wash or inhalation.

*Acidum Carbolicum Iodatum.* Phenol 6, iodine 2, glycerin 2.

Action; Anesthetic, antiseptic, irritant, caustic.

Uses: For intrauterine application, ringworm of the scalp, etc

*Acidum Citricum Saccharatum.*

*Acidum Tartaricum Saccharatum.*

For convenient prescribing of effervescent powders. See p. 41.

*Aqua Sedativa.* Eau Sedative de Respail. Ammonia water 12.5, spirit of camphor 1.2, sodium chloride 6.5, water 100.

Action: Antispasmodic.

Uses: Applied on compress for migraine, rheumatism, contusions. Also used internally in headache, fever.

Dose: 8 Cc.

*Bismuthi Oxidum Hydratum.* Bismuth oxide containing water of hydration, in form of a creamy white powder.

Uses: Well adapted for mixing with water (4 parts) to form a cosmetic known as "Cream of Bismuth."

*Caffeina Sodio-Benzoes.*

*Caffeina Sodio-Salicylas.*

Either of these contains 50 per cent. of caffeine, rendered soluble in 2 parts of water by the addition of the salt.

Uses: Especially adapted for hypodermic administration of caffeine.

Dose of either: 0.2 to 0.5 Gm.

#### PROPOSED PROGRAM FOR THE FIFTY-SIXTH ANNUAL MEETING.

Monday, September 7, 9:30 a. m., Meeting of the Council. First Session of the National Association of Boards of Pharmacy.

Monday, September 7, 3:00 p. m., First General Session.

Monday, September 7, 6:30 p. m., Meeting of the Nominating Committee.

Monday, September 7, 9:00 p. m., Reception and Ball.

Tuesday, September 8, 10:00 a. m., Second General Session.

Tuesday, September 8, 3:00 p. m., First Session of Section on Commercial Interests.

Tuesday, September 8, 8:00 p. m., Meeting of the American Conference of Pharmaceutical Faculties. Second Session of National Association of Boards of Pharmacy.

Wednesday, September 9, 10:00 a. m., First Session of Section on Pharmaceutical Education and Legislation.

Wednesday, September 9, 3:00 p. m., Second Session of Section on Pharmaceutical Education and Legislation.

Wednesday, September 9, 8:00 p. m., Third Session of Section on Pharmaceutical Education and Legislation.

Thursday, September 10, 10:00 a. m., First Session of Section on Scientific Papers.

Thursday, September 10, 3:00 p. m., Second Session of Section on Scientific Papers.

Thursday, September 10, 7:30 p. m., Lecture illustrated with stereopticon views, on Past Meetings and Past Members, by Henry M. Whelpley, under the auspices of the Historical Section.

Thursday, September 10, 8:30 p. m., Meeting of American Conference on Pharmaceutical Faculties.

Thursday, September 10, 10:00 p. m., Social Entertainment—Smoker.

Friday, September 11, 10:00 a. m., First Session of Section on Practical Pharmacy and Dispensing.

Friday, September 11, 3:00 p. m., Second Session of Section on Practical Pharmacy and Dispensing.

Friday, September 11, 8:00 p. m., Session of Section on Historical Pharmacy.

Saturday, September 12, 10:00 a. m., Final General Session.

It is understood that in place of a joint meeting of the Boards of Pharmacy and Pharmaceutical Faculties, these bodies be especially invited to attend the third session of the Section on Education and Legislation, as especially provided for at the last annual meeting.

The program was approved.

*Work of the Committee on National Formulary.*

LOUISVILLE, KY., June 23, 1908.

*To the Council of the A. Ph. A.:*

*Gentlemen:* In conformity with the plan outlined in Council Letter No. 7 (March 9, 1908), the Committee on National Formulary has organized by the assignment of the auxiliary members authorized by the vote of the Council to the several sub-committees proposed, among whom the task of correcting, revising and improving the "Formulary" has been so apportioned as to secure some reasonably effective work before the meeting of the Association in September, in so far as this is possible by correspondence.

In the course of the correspondence both before and following the assignment of the auxiliary members, it became evident, however, that if, as contemplated by your committee, it is designed to present a definite report upon which the Association can base its final instruction for the revision, it will be absolutely necessary that the entire committee, as now constituted, should meet in personal conference; that such a conference should be deliberate, and unhampered by the simultaneous meeting of the Association, and that, therefore, it should be held at some convenient date preceding the annual meeting.

While the Committee are in harmony on many points that come up in connection with the present revision, there are other points brought out by the great responsibility that attaches to the Formulary since it has become a national standard under the "Pure Food and Drugs Act" on which there exists some uncertainty and difference of opinion. In other respects, also, much more can be accomplished during a few hours of personal conference than by volumes of correspondence.

In consideration of the aforesaid, and under instruction by a practically unanimous vote of the committee, I have therefore formulated the accompanying motion, which in order that it may be discussed with deliberation, should lie over until August 1, 1908, when a vote should be taken.

Respectfully,

C. LEWIS DIEHL, *Chairman Com. on N. F.*

*Motion to authorize a meeting of the Committee on National Formulary at Hot Springs during the week preceding the annual meeting.*

The National Formulary having become a legal standard under the "Pure Food and Drugs Act," the Association is shouldered with the responsibility of making this work a commendable and acceptable standard in fact as well as a standard under the law.

Having heretofore no legal status, this work was probably not as free from faults as should be demanded from a book that has become the standard of authority for the preparations described herein. These considerations necessitate a careful revision of the formulas and possibly certain changes, definitions and additions.

What these consist in, and their extent, is at present problematical and must be determined by careful and deliberate consultation, which is possible only by personal conference.

The undersigned, therefore, move that the chairman of the Committee on National Formulary be authorized to call a meeting of the entire Committee as at present constituted to be held at Hot Springs, Ark., on Friday of the week immediately preceding



the annual meeting; that the members of the Committee in attendance be reimbursed for their expenses, covering actual cost of the excursion railway fare from their respective homes to Hot Springs and return; and that, in addition, they shall receive an allowance for sleeping car, hotel and incidental expenses incurred while engaged in the business of the Committee, such allowance not to exceed the sum of \$25.00 for members east, and \$20.00 for members residing west of the Alleghanies; and the total expenses of said meeting, to the Association shall not exceed one thousand dollars.

C. LEWIS DIEHL,  
S. A. D. SHEPPARD.

Motion carried.

Applicants for membership Nos. 129 to 145 were elected.

*Council Letter No. 13—St. Louis, July 24, 1908.*

The General Secretary was authorized to order 40 gold bars for the Hot Springs meeting.

#### PROPOSED BUDGET FOR 1908-9.

The Committee on Finance submits the following for approval;

Salaries .....	\$2800 00
Proceedings .....	3500 00
Printing and Stationery .....	350 00
Miscellaneous Expenses .....	250 00
Stenographers .....	300 00
Badges and Bars .....	90 00
Journals for Reporter .....	35 00
Committee on Membership .....	50 00
Traveling Expenses .....	250 00
Premium on Treasurer's Bond .....	12 50
Insurance .....	50 00
Certificates .....	30 00
Section on Scientific Papers .....	25 00
Section on Education and Legislation .....	25 00
Section on Commercial Interests .....	25 00
Section on Practical Pharmacy and Dispensing .....	50 00
Section on Historical Pharmacy .....	50 00
A. Ph. A. Bulletin .....	1500 00

The budget was approved.

Applicants for membership, Nos. 146 to 180 were elected.

*Council Letter No. 14—St. Louis, August 1, 1908.*

Applicants for membership, Nos. 181 to 183 inclusive were elected.

*Letter No. 15—St. Louis, August 12, 1908.*

*Motion No. 37. (Special Meeting of Committee on National Formulary).* James H. Beal offers the following which is seconded by Otto F. Claus. "In view of the necessity of carefully conserving our financial resources and of the fact that the members of the National Formulary Committee are all members of the American Pharmaceutical Association and as such will doubtless be in attendance at the Hot Springs meeting, the allowance for the meeting of such committee (See Motion No. 35, Council Letter No. 13, page 29) shall be limited to the hotel expenses from the date when said committee shall meet until the first general session of the American Pharmaceutical Association."

The motion was subsequently withdrawn.

Applicants for membership, Nos. 184 to 201 were elected.

*Council Letter No. 16—St. Louis, August 21, 1908.*

Applicants for membership, Nos. 202 to 206 were elected.

The above synopsis of the Council letters during the past year was approved.

The following report was submitted by the Chairman of the Council.

REPORT OF COUNCIL CHAIRMAN ON SAVINGS ACCOUNTS AND BONDS, JULY 1, 1908.

*Ebert Fund.*

Deposit with Boston Penny Savings Bank .....	\$941 96
--	----------

*Centennial Fund.*

Deposit with Boston Penny Savings Bank .....	\$1,248 65	
Mass. State Bond No. 1705 .....	1,000 00	
		\$2,248 65

*Life Membership Fund.*

Deposit with Boston Penny Savings Bank .....	\$3,034 55	
Mass. State Bonds No. 1701, 1702, 1703, 1704 .....	13,000 00	
		\$16,034 55

*Endowment Fund.*

Deposit with Boston Penny Savings Bank .....	2,445 31
--	----------

Total Savings and Invested Funds .....	\$21,670 47
--	-------------

The undersigned being first duly sworn depose and say that the above is a true statement of the savings accounts shown by the books of the Boston Penny Savings Bank, and of the Bonds in the hands of J. H. Beal, on July 1, 1908.

J. H. BEAL,

M. L. CREIGHTON,

JAMES M. SPIKER, *Notary Public.*

*July 13, 1908.*

The report was accepted and referred to the Committee on Publication.

The following was then submitted:

REPORT OF THE COMMITTEE ON PUBLICATION.

*Mr. Chairman and Members of the Council of the American Pharmaceutical Association:*

Your Committee on Publication beg leave to report that the Proceedings of the fifty-fifth annual meeting have been published and a copy of the same delivered in February of the present year and since that time to every member entitled thereto, according to the Treasurer's accounts, besides the usual number (about 100) of complimentary copies to the honorary members, state libraries, the pharmaceutical press, educational institutions and foreign scientific bodies. Of the total number of books, (2000) printed, 225 copies remain on hand in flat sheets, 1715 having been bound in cloth and 60 in paper. It was also found necessary during the past year to bind in cloth 50 copies of the 1905 volume and 25 copies each of the 1904 and 1906 volumes of Proceedings, the stock having become exhausted and demand arising for the same. The cost of publication and delivery for the year 1907-1908 is shown by the following items:

Composition, paper and press work (2000 copies) .....	\$2,215 36
Binding 1715 copies in cloth (1907) @ 23 cents .....	\$394 45
" 25 " " (1906) @ 23 cents .....	5 75
" 50 " " (1905) @ 23 cents .....	11 50
" 25 " " (1904) @ 23 cents .....	5 75
" 60 " paper (1907) @ 8 cents .....	4 80

Expressage and Postage, 1907 Volume .....	502 72
Illustrations .....	53 20
Journals for Reporter (Foreign) .....	31 14
Telegrams .....	0 75
Salary of the Stenographers .....	269 25
Salary of the Reporter on the Progress of Pharmacy .....	750 00

---

\$4,244 67

Your Committee is also pleased to report that the demand for the new edition of the National Formulary continues, but not as actively as last year; and that it became necessary to print another issue of 5000 copies of the book during the past year, making a total of 29,000 copies to date. The total expense to date of publishing, advertising and delivering the 3rd edition of the National Formulary amounts to \$9,699.06. An account of the receipts from sales of the National Formulary will appear in the report of the general secretary.

For the Committee,  
*Baltimore, July 1, 1908.*

CHAS. CASPARI, JR.,  
*Chairman.*

Received and placed on file.

Chairman Beal announces the following Committee on Credentials: J. W. England (Chairman), E. G. Eberle and F. C. Godbold.

The following report was presented:

*To the Council of the American Pharmaceutical Association:*

*Gentlemen:* The committee appointed to audit the books of the Association beg leave to report that the books of the Treasurer and the General Secretary, together with the vouchers accompanying the same, have been carefully examined and found correct.

The Committee finds that the Treasurer has received:

From sale of National Formulary .....	\$6,016 88
From sale of Semi-Centennial Index .....	28 08
From sale of Bars and Badges .....	50 25
From sale of Proceedings .....	96 43
From sale of Certificates .....	73 50
From payment of Annual Dues .....	8,525 00
From interest on Ebert Fund .....	30 00
From interest on Bank Deposits .....	211 08
From Life Membership Fees .....	250 00
From Endowment Fund .....	2,189 00

---

Total .....	\$17,470 22
Cash on hand, July 1, 1907 .....	8,855 75

---

Total .....	\$26,325 97
Disbursements .....	15,094 77

---

Balance on hand July 1, 1908..... \$11,231 20

Increase over balance on hand July 1, 1907, \$2,375.45.

The Committee has also examined the sworn statement of the Chairman of Council regarding the bonds and the balances of the various funds held by him for the Association; also the pass-book of the New England Trust Company, showing amount of deposit for account of the General Fund. They were found correct and to correspond with the books of the Treasurer.

The financial assets of the Association on July 1, 1908, were as follows:

The Ebert Fund .....	\$941	96
The Centennial Fund.....	2,248	65
The Life-Membership Fund.....	16,034	55
The Endowment Fund.....	2,445	31
The General Fund.....	11,231	20
Total.....	\$32,901	67
Value of funds as per last report.....	\$18,604	25
Cash on hand.....	8,855	75
	27,460	00
Net increase.....	\$5,441	67

LOUIS EMANUEL,  
J. A. KOCH.

*Pittsburgh, Pa., July 17, 1908.*

The report was received and approved.

The following was presented:

REPORT OF THE SECRETARY OF THE COUNCIL.

*"To the Chairman and Members of the Council:*

The Council of 1906-7 held seven sessions in New York City, last year. The new Council held two sessions and has transacted business by mail since the New York meeting. Fifteen Council letters have been issued, covering thirty-five pages and conveying thirty-nine motions. Two hundred and six new members have been elected and no applicants rejected. A further synopsis of the correspondence will be submitted, to become a part of the published records. The minutes have been published in full in the Bulletin of the A. Ph. A.

Eighteen colleges and boards of pharmacy have taken advantage of the nomination for membership, one year's dues and a special certificate of membership, offered by the association to prize students and candidates for registration. In order to distinguish such new members from those nominated by colleges of pharmacy, boards of pharmacy, and state associations, we have decided to designate them as "certificate prize members."

Respectfully submitted,

HENRY M. WHELPLEY.

*September 7, 1908.*

The report was received and approved.

Applicants for membership, Nos. 207 to 241 were duly elected.

The following motion was presented:

In view of the new method of electing officers of the Association and members of the Council which goes into effect at this meeting, it is moved by Chas. Caspari, Jr., seconded by M. I. Wilbert that the Nominating Committee be instructed to bring in two sets of Nominations, one for President, 1st, 2nd and 3rd Vice-Presidents to serve for the year 1908-1909 and three members of the Council to serve until 1911 and another for the same officers to serve for the year 1909-1910 and to be elected by mail in accordance with Chapter I of the By-Laws.

Motion carried.

Moved by J. L. Lemberger, seconded by Leo Eliel that October 1, 1908 be fixed as the date on which the transfer of the office of Treasurer be effected and that the transfer of the books, cash, etc., to the new treasurer be made in the presence of a third party as witness.

Motion carried.

Moved by Leo Eliel, seconded by J. W. England, that the General Secretary be instructed to take the necessary legal steps for the renewal of the corporate existence of the associa-

tion for the greatest length of time permissible, and that he be authorized to join with him in such action, such other members and officials as may be necessary for compliance with the requirement of the law.

Motion carried.

Moved by A. M. Roehrig, seconded by Chas. Caspari, Jr., that Article IV, Chapter I of the By-Laws be amended by striking out the words "majority vote of the members of the Association" and inserting in place thereof the words "plurality of the votes cast."

Motion carried.

The following was then presented by J. H. Beal:

"The present nation-wide movement for certainty of quality and the honest labeling of products which by their nature are subject to adulteration and sophistication is not temporary or spasmodic, but is the result of the slow accumulation of sentiment during the past half century or more.

"Originally limited principally to foods and drugs, its scope has been widened so as to include numerous technical products which have no relation to diet or medicine, and it is not likely to reach high tide until practically every article used in the arts or in the daily life of the community has been provided with an appropriate standard, and bears a truthful label.

"The selection and determination of practicable standards of strength and purity, and the adoption of an appropriate nomenclature to correspond thereto, is therefore quite as important a matter as the prohibition of adulteration and misbranding itself, and is in fact an essential part of such prohibition, and one of the most important topics just now engaging the attention of food and dairy officials.

"For the commonly used drugs and medicinal chemicals we have the United States Pharmacopœia and the National Formulary, though both of these labor under the disadvantage of having been prepared primarily as professional guides rather than as legal standards, and being afterwards adopted by the Federal Food and Drugs Act, do not always perfectly fit the task somewhat suddenly imposed upon them. So also there is in course of preparation what might be considered a third list of standards or medicinal chemicals, being those determined by the Council of Pharmacy and Materia Medica of the American Medical Association.

"While these three authoritative works cover their respective fields in a fairly satisfactory manner, they leave uncovered the broader field which includes the substances used in the arts and technical industries, and also a large number of drugs and drug combinations which, though they have not attained the honor of recognition by any of the foregoing authorities, are yet important articles of daily drug commerce.

"For all of this large number of substances there must and will be standards adopted, and it is a matter of prime importance to the industries concerned that the source from which these standards emanate should be fully competent to deal with the subject.

"If their creation is left to the federal and state departments which are charged with the enforcement of the labeling and anti-adulteration laws, they will be created piecemeal, as the exigencies of the departments require, will be as numerous as the authorities creating them, and will be brought into interstate uniformity only after a long and painful struggle. They will frequently be determined by men who, however competent in their own lines of work, will have no technical knowledge of the manufacture and use of the articles for which they undertake to set the limits of strength and purity, as was the case during the past year, where a food and dairy chemist was called upon to establish, and did establish the standards which were subsequently enacted as a part of a paint law.

"So, also, if these standards have a political origin they will almost certainly, like the oleomargarine standards, be tinctured with politics, and will almost always be composed with one prime object in view, namely, to convict the accused as easily and as speedily as possible.

"Another source for the creation and promulgation of such a body of standards would be some great national association of sufficient dignity and influence to insure that its resolutions would be given respectful consideration by courts and law-making bodies.

"It should be an association whose membership embraces representatives of every interest concerned with the production, distribution and use either in a commercial or scientific way of the substances with which such a system of standards must deal. It should be an association in which political influence can not find place or support, and one which is wholly ethical in its purposes, but which follows practical rather than utopian ideals, in short, the inauguration of a system of nomenclature for products not covered by the existing recognized standards, and for the setting of the limits of strength and purity for such products should be under the auspices of such a body as the American Pharmaceutical Association.

"The fitness of this association to inaugurate such an undertaking, and the importance of the work itself, are so palpably evident that to enlarge upon these topics seems superfluous.

"As a tentative scheme for the inauguration of such a work, the following is offered."

*Resolved*, 1. There shall be a standing committee of the Council to be known as the Committee on Standards of Non-Official Drugs and Chemical Products, consisting of fifteen members elected by the council, but the members of such committee need not be members of the Council.

2. The first committee shall be constituted as follows: two representatives from firms engaged in the manufacture of chemicals, two representatives from firms engaged in the manufacture of pharmaceuticals, two representatives engaged in the wholesaling of drugs and chemicals, five retail druggists, and four representatives from the faculties of colleges of pharmacy.

3. The committee shall prepare from existing sources of information, a tentative list, subject to revision, correction and extension by this association of the principal drugs, chemicals and medicinal preparations not recognized by the United States Pharmacopoeia with a suitable system of nomenclature for the same, and shall adopt suitable limits of strength and purity therefor.

4. The Chairman of said committee shall be designated by the Council, and the committee shall report progress annually.

5. The committee first chosen shall serve for one year, and at the next annual meeting of the Council shall report upon a plan for the permanent organization of the committee, and also upon a plan for the permanent continuance of the work.

The resolutions were seconded by H. M. Whelpley and discussed by Messrs. Whelpley, England, Searby, Lemberger, Oldberg, Eberle and Eliel.

On motion, the resolutions were adopted.

Amendment to By-laws proposed.

Moved by Chas. Caspari, Jr., seconded by H. M. Whelpley to amend Article xiii of Chapter ix by transposing Sections 6 and 7, and changing the number of said sections in accordance therewith.

Motion carried.

On motion the Council adjourned to meet at 9 a. m. Tuesday, at the Eastman Hotel.

President Searby here resumed the chair, and called for action on the minutes of the Council as read.

Mr. Hallberg thought the last resolution read as part of the minutes of the Council, providing for the creation of a standing Committee of Standards of Non-Official Drugs and Chemical Products, was a matter of too great importance to be passed on intelligently, without full consideration

and discussion, and Mr. J. P. Remington, joined him in this view, moving that the matter be made a special order for the earliest convenient time, in order that full discussion might be had in general session.

This suggestion precipitated a discussion participated in by Messrs. Oldberg, Payne, J. P. Remington, R. H. Walker, and L. E. Sayre, which developed the fact that all of the speakers were in favor of the motion except Mr. Oldberg, who was inclined to let the matter go as it was, in view of the fact that the Council had carefully considered the proposition, and the committee's duties as outlined would be merely of a tentative nature at most, to prepare a basis for future action when the matter would come before the Association in an intelligent form for consideration and disposition. The real object of the resolution was, as he considered it, to prevent the Association from losing identity in this matter, and to show to others who would take up this work, if the American Pharmaceutical Association does not, that the pharmacists of America, who are more vitally interested than any other set of men, are alive to their opportunity and duty in this behalf.

At the conclusion of the discussion, the question raised by the resolutions was set as a special order for to-morrow (Tuesday) at 12 o'clock, at the suggestion of the General Secretary.

The minutes of the Council, with the exception noted, were then approved as read, on motion of Mr. Hallberg.

Mr. Oldberg called attention to the fact that, as the By-Law now reads, it calls for a vote of the majority of the membership to decide the election of officers—an impossible requirement: it should read, as recommended by the Council, that a plurality of the *votes cast* will elect. He thought it well to have this understood, in approving the minutes of the Council.

The Secretary called the list of standing and special committees as follows, to give notice to the chairmen to present their reports to the General Secretary as early as possible, as the reading of such reports would begin to-morrow morning and continue until completed:

*Committee on National and State Legislation*—Oscar Oldberg, Chairman.

*Committee on U. S. Pharmacopæia*—A. B. Lyons, Chairman.

*Committee on Time and Place*—D. W. Kirkland, Chairman.

*Committee on National Formulary*—C. Lewis Diehl, Chairman.

*Committee on Organization of Local Branches*—Philip Asher, Chairman.

*Committee on Proposed Pharmaceutical Collection at Washington*—Edward Kremers, Chairman.

*Committee on William Procter, Jr., Monument Fund*—John F. Hancock, Chairman.

*Committee on Publicity*—C. A. Mayo, Chairman.

*Committee on Reorganization*—C. S. N. Hallberg, Chairman.

*Committee on General Membership and Reception*—W. B. Day, Chairman.

*Committee on Weights and Measures*—H. G. Lohmann, Chairman.

*Committee on Status of Pharmacists in the Government Service*—George J. Seabury, Chairman.

*Delegates to Section on Pharmacology A. M. A.*—J. P. Remington, Chairman.  
*Delegates to National Association Retail Druggists*—J. P. Remington, Chairman.  
*Delegates to National Wholesale Druggists Association*—C. A. Mayo, Chairman.

The Chair called for the report of the Committee on Credentials, and Mr. J. W. England, Chairman, presented the report as follows :

#### REPORT OF THE COMMITTEE ON CREDENTIALS.

*To the President and Members of the American Pharmaceutical Association :*

Your Committee on Credentials beg leave to report that they have examined the credentials presented by the delegates of the various organizations named below, and find them in proper form :

*Colleges of Pharmacy.*—Albany, Brooklyn, Buffalo, California, Maryland, Massachusetts, National, New Jersey, New Orleans, New York, Philadelphia, Pittsburg, St. Louis—13.

*Schools of Pharmacy.*—Northwestern University, University of Kansas, University of Iowa, University of Illinois, University of Maryland, University of Michigan, University of Minnesota, State University of Oklahoma, Vanderbilt University—9.

*State Pharmaceutical Associations.*—Alabama, Arkansas, California, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Nebraska, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia, Wisconsin—34.

*Alumni Associations.*—Brooklyn College of Pharmacy, Philadelphia College of Pharmacy—2.

*U. S. Government Service.*—Public Health and Marine Hospital Service, Department of Agriculture, Bureau of Medicine and Surgery of the U. S. Navy—3.

*National Associations.*—American Medical Association, National Association of Retail Druggists, National Wholesale Druggists Association.—3.

*Local Associations.*—Los Angeles Retail Druggists Association, Manhattan Pharmaceutical Association, Philadelphia Branch of the A. Ph. A.—3.

J. W. ENGLAND, *Chairman.*  
 E. G. EBERLE.  
 F. C. GODBOLD.

On motion of Mr. Francis B. Hays, of New York, seconded by Mr. Kennedy, of the same city, the report just made was received and accepted.

The Chair here declared a recess of five minutes, to give the delegates from the various states, territories and provinces of Canada an opportunity to select two members from each state to serve on the Nominating Committee. After the recess, the General Secretary called the roll of the States, Territories and Provinces, and the Nominating Committee was made up as follows :

<i>For Arkansas</i> —W. L. Dewoody, J. F. Dowdy.	<i>For Georgia</i> —W. S. Elkin, Jr., Geo. F. Parque.
<i>For California</i> —Wm. M. Searby, Mrs. F. Howard.	<i>For Illinois</i> —C. H. Avery, C. S. N. Hallberg.
<i>For District of Columbia</i> —M. G. Motter, L. F. Kebler.	<i>For Indiana</i> —Leo. Eliel, F. W. Meissner.
<i>For Florida</i> —W. O. Richtmann.	<i>For Iowa</i> —J. M. Lindly, W. J. Teeters.
	<i>For Kansas</i> —L. E. Sayre.
	<i>For Kentucky</i> —J. O. Cook, C. Lewis Diehl.



<i>For Louisiana</i> —Philip Asher, F. C. Godbold.	<i>For Oklahoma</i> —H. D. Kniseley, F. B. Lillie.
<i>For Maryland</i> —H. A. B. Dunning, Louis Schulze.	<i>For Pennsylvania</i> —J. P. Remington, M. I. Wilbert.
<i>For Massachusetts</i> —F. A. Hubbard, E. O. Engstrom.	<i>For South Dakota</i> —R. M. Cotton, I. A. Keith.
<i>For Michigan</i> —A. B. Stevens, Harry B. Mason.	<i>For Tennessee</i> —Jas. O. Burge, F. W. Ward.
<i>For Missouri</i> —J. M. Good, Chas. E. Caspari.	<i>For Texas</i> —R. H. Walker, E. G. Eberle.
<i>For Nebraska</i> —A. V. Pease, R. A. Lyman.	<i>For Vermont</i> —D. F. Davis, A. L. Cheney.
<i>For New Jersey</i> —Chas. Holzhauer, Geo. M. Beringer.	<i>For Virginia</i> —Jas. L. Avis, T. A. Miller.
<i>For New York</i> —Geo. C. Dieckman, R. B. Gable.	<i>For Washington</i> —C. Osseward, C. W. Johnson.
<i>For North Carolina</i> —E. V. Howell, F. B. Hays.	<i>For Wisconsin</i> —H. G. Ruenzel.
<i>For Ohio</i> —Geo. B. Kauffman, W. F. Kaemmerer.	<i>For New Mexico</i> —B. Ruppe.
	<i>The Association at Large</i> —A. M. Roehrig, H. M. Whelpley, Jas. H. Beal, Jas. L. Lemberger, J. W. Forbes.

The General Secretary called attention to the peculiar and unusual duties of the Nominating Committee this year, in that it would have to bring in two tickets, one for officers of the Association for the ensuing year—except for Secretary, Treasurer and Reporter on the Progress of Pharmacy, hereafter to be elected by the Council—and one for officers to be voted for by the Association at large, to serve for the year 1909-10, the latter ticket to consist of three names for each office, so as to give the membership some latitude of choice in voting by mail this fall, the result of the election to be announced in the "Bulletin."

On motion of Mr. Hallberg, the Association adjourned until 10 o'clock to-morrow (Tuesday) morning.

#### \* SECOND SESSION—TUESDAY MORNING, SEPTEMBER 8, 1908.

The second general session was called to order by President Searby at 10:20 a. m., and the Secretary read the minutes of the first session, which, on motion of Mr. Richardson, were approved as read.

Mr. Mason, of Detroit, chairman of the Nominating Committee, made report for that committee as follows:

#### REPORT OF THE NOMINATING COMMITTEE.

HOT SPRINGS, ARK., Sept. 8, 1908.

*To the Officers and Members of the American Pharmaceutical Association:*

*Gentlemen:* Your Nominating Committee held a meeting last evening and after duly organizing by the election of Mr. Harry B. Mason, of Detroit, as chairman, and the undersigned as secretary, proceeded with the business for which it was created. As a result we take pleasure in presenting the following ticket for your consideration at this meeting:

*For President*—Mr. Oscar Oldberg, of Chicago, Ill.

*For First Vice-President*—Mr. Eugene G. Eberle, of Dallas, Tex.

*For Second Vice-President*—Mr. William Mittelbach, of Boonville, Mo.

*For Third Vice-President*—Mr. James H. Beal, of Scio, O.

*For Members of the Council for Three Years*—Mr. H. P. Hynson, of Baltimore, Md.; Mr. S. A. D. Sheppard, of Boston, Mass.; and Mr. William M. Searby, of San Francisco, Calif.

The Committee had a new duty to perform under our amended by-laws, namely, the selection of a ticket consisting of three nominees for each of the above-mentioned officers, to be voted for by mail, to hold office during the year 1909-1910. Your Committee discharged this duty by selecting the following names.

*For President*—Mr. Eugene G. Eberle, of Dallas, Tex.; Mr. Henry H. Rusby, of New York, N. Y.; and Mr. A. B. Stevens, of Ann Arbor, Mich.

*For First Vice-President*—Mr. C. B. Lowe, of Philadelphia, Pa.; Mr. F. B. Lillie, of Guthrie, Okla.; and Mr. F. B. Schachleiter, of Hot Springs, Ark.

*For Second Vice-President*—Mr. C. W. Johnson, of Seattle, Wash.; Mr. Francis B. Hays, of New York, N. Y.; and Mr. Murray G. Motter, of Washington, D. C.

*For Third Vice-President*—Mr. E. V. Howell, of Chapel Hill, N. C.; Mr. W. B. Day, of Chicago, Ill.; and Mr. John B. Bond, Sr., of Little Rock, Ark.

*For Members of the Council for Three Years*—Mr. George M. Beringer, of Camden, N. J.; Mr. Oscar Oldberg, of Chicago, Ill.; Mr. A. M. Roehrig, of Stapleton, N. Y.; Mr. Charles E. Caspari, of St. Louis, Mo.; Mr. J. W. England, of Philadelphia, Pa.; Mr. F. W. R. Perry, of Detroit, Mich.; Mr. William Mittelbach, of Boonville, Mo.; Mr. W. L. Dewoody, of Pine Bluff, Ark., and Mr. Harry B. Mason, of Detroit, Mich.

As under the new by-laws the General Secretary, the Treasurer and the Reporter on the Progress of Pharmacy are elected by the Council, your committee did not make any nominations for these offices.

Respectfully submitted,

FRANCIS B. HAYS,  
*Secretary of the Committee.*

On motion of Mr. Lemberger, the report was received.

The General Secretary suggested that, according to custom, the vote for President be taken by a separate ballot, first. Thereupon Mr. Eliel, seconded by Mr. Henry Kraemer, moved that the Secretary cast the affirmative ballot of the Association for Mr. Oscar Oldberg, of Chicago, for President of the Association for the ensuing year, and the motion was adopted. The Secretary announced that he had cast the ballot as directed, and the Chair declared Mr. Oldberg duly elected.

On motion of Mr. M. I. Wilbert the Secretary was directed to cast the affirmative ballot of the Association for the committee's nominees for First, Second and Third Vice-Presidents. Mr. Caspari announced that he had cast the ballot as directed for Messrs. E. G. Eberle, of Dallas, Texas; William Mittelbach, of Boonville, Mo., and James H. Beal, of Scio, O., for First, Second and Third Vice-Presidents, respectively, and the Chair declared these gentlemen duly elected.

The Chair called for action in regard to the three members of the Council, and Mr. Hays, of New York, moved that the same proceeding be followed as before. The motion prevailed; the Secretary announced that he had cast the ballot of the Association for Messrs. Henry P. Hynson, of

Baltimore ; S. A. D. Sheppard, of Boston and William M. Searby, of San Francisco, as members of the Council for the ensuing three years, and they were declared duly elected by the Chair.

The Secretary called attention to the fact that the election of Mr. Eberle as First Vice-President had created a vacancy in the Council. Thereupon, Mr. Whelpley presented the name of Mr. F. W. Meissner, Jr., of La Porte, Ind., a man already experienced in this work, to fill the vacancy. On motion of Mr. Eliel, nominations were closed and the Secretary directed to cast the ballot of the Association electing Mr. Meissner. This direction was carried out, and the Chair declared the gentleman duly elected.

Mr. Whelpley, Secretary, read the minutes of the fourth session of the Council, held this (Tuesday) morning, September 8th, at the Hotel Eastman :

FOURTH SESSION OF THE COUNCIL.

EASTMAN HOTEL, HOT SPRINGS, ARK., *September 8, 1908.*

Council called to order at 9 : 30 a. m., by Chairman Beal, with the following members present: Messrs. Apple, Beal, Caspari, Jr., Eberle, Eisele, Eliel, England, Godbold, Howell, Keith, Lemberger, Oldberg, Remington, Roehrig, Searby, Whelpley and Wilbert.

On motion, new members 242 to 252 inclusive were duly elected.

On motion by H. M. Whelpley, seconded by the members of the Council present, S. A. D. Sheppard was nominated as honorary president for the ensuing year. The motion prevailed by a rising vote.

On motion by M. I. Wilbert, it was decided to set the next meeting of the Council as the time for election of treasurer, general secretary and reporter on Progress of Pharmacy.

On motion by Charles Caspari, Jr., a committee of three was appointed to consider and report on further compensation for the chairman of the Committee on National Formulary. The Chair named Leo Eliel, J. L. Lemberger and Charles Caspari, Jr.

On motion by A. M. Roehrig, seconded by E. G. Eberle, the request of the Meyer Brothers Drug Co. for permission to use certain portions of the text of the National Formulary in the manner described by a communication before the Council was granted upon condition that the firm acknowledge in a suitable place in the volume to be published that authority for the use of portions of the text of the National Formulary was granted by the Council of the A. Ph. A.

On motion, the Council adjourned to 9 a. m., Wednesday.

On motion of Mr. Asher, of New Orleans, the minutes of the Council were approved as read.

The Chair called attention to the fact that the Council had nominated Mr. S. A. D. Sheppard, for Honorary President of the Association, and suggested that the Association proceed to his election. Thereupon Mr. Hallberg, seconded by Mr. Roehrig, moved that Samuel Arus Darlington Sheppard, of Boston, Mass., be elected Honorary President of the American Pharmaceutical Association by a unanimous rising vote, and this was done, amid the applause of the members.

The report of the Treasurer was called for as the next order of business,

and the Secretary stated that Treasurer Sheppard had sent his report to him, with request that he read same to the Association; but it was quite voluminous, and he would suggest that he give a synopsis of it only, omitting the long detailed statement of payment of accounts—especially as the report had been audited by a committee and was before the Association in due form for action. No objection was offered, and the Secretary presented the report in abstract, the full text thereof being as follows:

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL  
ASSOCIATION, JULY 1, 1907, TO JULY 1, 1908.

RECEIPTS.

Cash on hand July 1, 1907.....		\$8,855 75
Received from sale of 3 certificates @ \$7.50.....		22 50
“ “ 9 certificates @ \$5.00.....		45 00
“ “ 2 certificates @ \$3.00.....		6 00
“ “ Proceedings.....		96 43
“ “ Badges and Bars.....		50 25
“ “ National Formulary.....		6,016 88
“ “ Semi-Centennial Index.....		28 08
Received on account of Ebert Fund.....		30 00
“ Interest on Deposit in New England Trust Co., Boston.....		211 08
“ Annual Dues, 1904.....	\$15 00	
“ “ 1905.....	125 00	
“ “ 1906.....	385 00	
“ “ 1907.....	4,925 00	
“ “ 1908.....	3,065 00	
“ “ 1909.....	10 00	
		8,525 00
“ from Life Membership Fees—		
Ewen McIntyre.....	\$25 00	
Ewen McIntyre, Jr.....	100 00	
David O. Haynes.....	25 00	
Ezra J. Kennedy.....	25 00	
Gustave Scherling.....	25 00	
William C. Dewoody.....	25 00	
George M. Boyd.....	25 00	
		250 00
Received for Endowment Fund—		
George B. Evans.....	\$10 00	
Eustace H. Gane.....	5 00	
Garett V. Dillenback.....	5 00	
Frederick G. Fricke.....	5 00	
Philip J. Ackerman.....	1 00	
Karl Castlehun.....	5 00	
John Eckert.....	5 00	
Frederick W. Sultan.....	50 00	
John U. Lloyd.....	20 00	
Henry M. Whelpley.....	25 00	
William O. Allison.....	250 00	
Mrs. Emlen Painter.....	10 00	

Frank G. Ryan .....	250 00	
Committee of Arrangements for New York meeting, 1907 .....	1,380 00	
Fred. Roemer .....	3 00	
William A. Frost.....	5 00	
John F. Patton .....	25 00	
Eugene G. Eberle.....	5 00	
J. D. August Hartz.....	15 00	
Edward N. E. Klein.....	5 00	
Joseph F. Pearson.....	5 00	
James H. Beal and S. A. D. Sheppard .....	105 00	
		<u>\$2,189 00-</u>
Total .....		\$26,325 97

## DISBURSEMENTS.

1907. August	13. Check 1318. Wickersham Printing Co., Proceedings.....	\$804 94
	22. Check 1319. John S. Bridges & Co., Printing and Stationery	8 50
	22. Check 1320. Nixon-Jones Printing Co., Printing and Stationery .....	6 10
	22. Check 1321. Philadelphia Branch A. Ph. A., Committee on Membership.....	25 00
	22. Check 1322. Carl S. N. Hallberg, A. Ph. A. Bulletin.....	89 69
	22. Check 1323. W. B. Day, Sect'y-Treas., Committee on Membership .....	13 00
	22. Check 1324. James H. Beal, Miscellaneous Expenses .....	8 57
	22. Check 1325. I. U. Libby, Certificates.....	6 75
	22. Check 1326. Wickersham Printing Co.—	
	Proceedings .....	\$20 81
	Insurance .....	5 00
	National Formulary .....	409 28
		<u>435 09</u>
	22. Check 1327. C. Lewis Diehl, Balance of salary due for the fiscal years 1904, 1905, 1906, as per vote of Council.....	225 00
	22. Check 1328. S. A. D. Sheppard, Balance of salary due for the fiscal years 1904, 1905, 1906, as per vote of Council..	225 00
	22. Check 1329. Charles Caspari, Jr., Balance of salary due for the fiscal years 1904, 1905, 1906, as per vote of Council..	300 00
	22. Check 1330. H. M. Whelpley, Balance of salary due for the fiscal years 1904, 1905, 1906, as per vote of Council .....	90 00
	22. Check 1331. Charles Caspari, Jr.—	
	Badges and Bars .....	\$ 0 16
	National Formulary.....	152 24
	Proceedings .....	3 82
	Semi-Centennial Index.....	36
	Miscellaneous Expenses.....	13 93
		<u>169 61</u>
	30. Check 1332. Buck Printing Co., Printing and Stationery..	47 50
	30. Check 1333. Security Storage & Trust Co., Miscellaneous Expenses .....	10 00
	30. Check 1334. William T. Wenzell, Committee on Membership .....	3 00

August	30.	Check 1335. Wickesham Printing Co., National Formulary	270 22
	30.	Check 1336. H. A. B. Dunning, Section on Practical Pharmacy and Dispensing .....	17 20
October	1.	Check 1337. Henry Briele, Badges and Bars .....	76 10
	1.	Check 1338. William M. Searby, Miscellaneous Expenses .	4 50
	1.	Check 1339. Thomas P. Cook, Section on Historical Pharmacy.....	10 00
	1.	Check 1340. William T. Wenzell, Committee on Membership .....	2 00
	1.	Check 1341. Nixon-Jones Printing Company, Printing and Stationery.....	3 75
	1.	Check 1342. Joseph M. England, Section on Education and Legislation .....	13 50
	1.	Check 1343. Charles Caspari, Jr., Traveling Expenses....	48 84
	1.	Check 1344. C. S. N. Hallberg, Second half-year's salary as Editor of A. Ph. A. Bulletin.....	100 00
	1.	Check 1345. Nixon-Jones Printing Company, Printing and Stationery .....	12 55
	1.	Check 1346. Buck Printing Company, Printing and Stationery.....	5 00
	8.	Check 1347. The State Stenographers.....	69 25
	8.	Check 1348. S. C. Malone, Special appropriation for College of Pharmacy Prize Certificates .....	10 00
	8.	Check 1349. E. J. Richardson & Sons, Insurance .....	26 00
	8.	Check 1350. C. S. N. Hallberg, A. Ph. A. Bulletin .....	86 39
	8.	Check 1351. Nixon-Jones Printing Company, Printing and Stationery.....	13 30
	8.	Check 1352. Wickesham Printing Company—	
		National Formulary .....	\$591 00
		Proceedings .....	5 75
		Miscellaneous Expenses .....	34 00
			630 75
	24.	Check 1353. S. A. D. Sheppard, Treasurer, for Ebert Prize; awarded to Dr. Frederick B. Power, of London, Eng....	30 00
	24.	Check 1354. S. A. D. Sheppard, Traveling Expenses .....	47 85
	24.	Check 1355. John H. Bridges & Co.—	
		Printing and Stationery .....	\$32 61
		National Formulary Circulars .....	3 50
		Section on Historical Pharmacy .....	3 19
		Section on Commercial Interests.....	3 17
		Section on Scientific Papers.....	3 17
		Section on Practical Pharmacy and Dispensing .	3 17
			48 81
November	4.	Check 1356. Harmegnies & Howell, Section on Education and Legislation .....	4 00
	4.	Check 1357. J. G. McLean, Stenographer .....	200 00
	4.	Check 1358. Security Storage & Trust Co., Miscellaneous Expenses. ....	10 00
	4.	Check 1359. John S. Bridges & Co.—	
		Miscellaneous Expenses.....	4 00
		Section on Education and Legislation.....	3 91
			7 91

November	4.	Check 1360.	Carl S. N. Hallberg, A. Ph. A. Bulletin .....	114 20
	11.	Check 1361.	Alpha Photo-Engraving Co., Proceedings....	16 95
	11.	Check 1362.	William T. Wenzell, Committee on Membership .....	1 00
	11.	Check 1363.	John G. Bridges & Co., Section on Practical Pharmacy and Dispensing.....	3 20
	11.	Check 1364.	Regan Printing House, Ebert Memorial Volume.....	464 25
	11.	Check 1365.	Carl S. N. Hallberg, Ebert Memorial Volume.	43 79
December	11.	Check 1366.	John S. Bridges & Co., Printing and Stationery .....	1 90
	11.	Check 1367.	Alpha Photo-Engraving Co., Proceedings....	13 20
	11.	Check 1368.	Carl S. N. Hallberg, A. Ph. A. Bulletin .....	98 50
	11.	Check 1369.	Wickersham Printing Co.— Proceedings .....	11 50
			Miscellaneous Expenses.....	11 60
	18.	Check 1370.	Nixon-Jones Printing Co., Printing and Stationery .....	23 10
	18.	Check 1371.	Wickersham Printing Co., National Formulary	12 60
	18.	Check 1372.	C. Lewis Diehl, first half-year's salary as Reporter on Progress of Pharmacy, 1907-1908 .....	124 18
	18.	Check 1393.	H. M. Whelpley, first half-year's salary as Secretary of Council and Committee on Membership, 1907-1908.....	375 00
	18.	Check 1374.	Carl S. N. Hallberg, A. Ph. A. Bulletin Editor's salary, first half-year of 1907-1908 .....	150 00
	18.	Check 1375.	S. A. D. Sheppard, first half-year's salary as Treasurer, 1907-1908 .....	100 00
	18.	Check 1376.	Charles Caspari, Jr., first half-year's salary as General Secretary, 1907-1908.....	375 00
				500 00
1908.				
January	2.	Check 1377.	E. F. Kelly, Secretary, Committee on Membership .....	3 00
	2.	Check 1378.	G. P. Engelhard & Co., Proceedings .....	1 50
	2.	Check 1379.	Alpha Photo-Engraving Co., Proceedings ...	18 20
February	4.	Check 1380.	Carl S. N. Hallberg, A. Ph. A. Bulletin .....	105 23
	5.	Check 1381.	Carl S. N. Hallberg, A. Ph. A. Bulletin .....	101 83
	5.	Check 1382.	John S. Bridges & Co., Printing and Stationery	23 00
	5.	Check 1383.	Wickersham Printing Co., National Formulary	115 00
	5.	Check 1384.	H. M. Whelpley, Miscellaneous Expenses....	8 30
	21.	Check 1385.	Alpha Photo-Engraving Co., Proceedings ...	3 35
	21.	Check 1386.	Wickersham Printing Co., Proceedings.....	23 82
March	21.	Check 1387.	John S. Bridges & Co., Printing and Stationery	5 00
	4.	Check 1388.	Carl S. N. Hallberg, A. Ph. A. Bulletin.....	100 22
	4.	Check 1389.	Buck Printing Company, Printing and Stationery .....	49 00
	4.	Check 1390.	American Bank Note Co., Certificates.....	45 00
	3.	Check 1391.	Charles Caspari, Jr.— National Formulary.....	\$43 67
			Proceedings .....	9 97
			Journals for Reporter.....	31 14

		Badges and Bars.....	40	
		Miscellaneous Expenses. ....	18 55	
				103 73
March	9.	Check 1392. Wickersham Printing Co., Proceedings.....		2238 32
	28.	Check 1393. Northwestern Branch A. Ph. A., Committee on Membership .....		4 00
	28.	Check 1394. U. Holzer, Miscellaneous Expenses.....		9 75
	28.	Check 1395. Wickersham Printing Co., Proceedings.....		795 55
	28.	Check 1396. John S. Bridges & Co., Printing and Stationery .....		4 00
	30.	Check 1397. Carl S. N. Hallberg, A. Ph. A. Bulletin .....		108 69
April	14.	Check 1398. Wickersham Printing Co., National Formulary .....		115 00
	15.	Check 1399. John S. Bridges & Co., Printing and Stationery .....		26 10
May	1.	Check 1400. S. A. D. Sheppard & Co., Miscellaneous Expenses .....		70 25
	1.	Check 1401. William B. Day, Secretary-Treasurer, Committee on Membership.....		14 00
	1.	Check 1402. Security Storage and Trust Co., Miscellaneous Expenses.....		10 00
	1.	Check 1403. Carl S. N. Hallberg, A. Ph. A. Bulletin.....		103 17
	1.	Check 1404. Regan Printing House, Miscellaneous Expenses .....		8 00
	15.	Check 1405. Wickersham Printing Co., Proceedings .....	54 50	
		Miscellaneous Expenses .....	2 07	
		National Formulary .....	55 97	
				112 54
June	2.	Check 1406. Carl S. N. Hallberg, A. Ph. A. Bulletin.....		101 38
	2.	Check 1407. Nixon-Jones Printing Co., Printing and Stationery.....		12 55
	2.	Check 1408. Buck Printing Co., Printing and Stationery...		47 00
	17.	Check 1409. C. Lewis Diehl, second half-year's salary as reported on Progress of Pharmacy, 1907-1908.....		375 00
	17.	Check 1410. S. A. D. Sheppard, second half-year's salary as Treasurer, 1907-1908.....		375 00
	17.	Check 1411. Henry M. Whelpley, second half-year's salary as Secretary of Council and Committee on Membership, 1907-1908 .....		150 00
	17.	Check 1412. Carl S. N. Hallberg, A. Ph. A. Bulletin. Editor's Salary, second half-year of 1907-1908.....		100 00
	17.	Check 1413. Charles Caspari, Jr., second year's salary as General Secretary, 1907-1908.....		500 00
	17.	Check 1414. Frank B. Davis, Certificates .....		6 75
	23.	Check 1415. The Keating Company, Miscellaneous Expenses .....		5 00
	23.	Check 1416. Edward Kremers, Section on Historical Pharmacy .....		25 00
				<u>\$12655 77</u>
		Life Membership Fund.....		250 00
		Endowment Fund.....		2189 00
				<u>\$15094 77</u>



## SUMMARY OF DISBURSEMENTS.

Proceedings .....	\$4,022 18
Stenographers .....	269 25
Journals for Reporter on Progress of Pharmacy .....	31 14
Salaries .....	2,800 00
Traveling Expenses .....	96 69
Section on Practical Pharmacy and Dispensing .....	23 57
Section on Education and Legislation .....	21 41
Section on Commercial Interests .....	3 17
Section on Scientific Papers .....	3 17
Section on Historical Pharmacy .....	38 19
Committee on Membership.....	65 00
Committee on Prize Certificates.....	10 00
Printing and Stationery .....	310 46
Insurance .....	31 00
Badges and Bars .....	76 66
Certificates .....	58 50
Ebert Prize .....	30 00
Miscellaneous Expenses .....	227 62
Life Membership Fund ... ..	250 00
Endowment Fund .....	2,189 00
National Formulary.....	1,880 06
Semi-Centennial Index .....	36
A. Ph. A. Bulletin .....	1,309 30
Balance of Salaries for the fiscal years 1904-1905-1906.....	840 00
Ebert Memorial Volume .....	508 04
Total amount of Disbursements.....	\$15,094 77
Cash on hand July 1, 1908 .....	11,251 20
Total .....	\$26,325 97

APPROPRIATIONS AND EXPENDITURES UNDER THE SAME FOR THE FISCAL YEAR, JULY 1,  
1907, TO JULY 1, 1908, TRANSFERS, AS AUTHORIZED BY GENERAL RULE OF FINANCE,

NO. 13, INCLUDED.

	Appropriations and Transfers.	Expenditures.
Salaries .....	\$2,800 00	\$2,800 00
Proceedings .....	4,100 00	4,022 18
Printing and Stationery .....	350 00	338 08
Miscellaneous Expenses.....	227 62	227 62
Stenographers .....	300 00	269 25
Badges and Bars.....	90 00	76 66
Journals for Reporter on Progress of Pharmacy.....	35 00	31 14
Committee on Membership.....	232 30	65 00
Committee on Prize Certificates .....	10 00	10 00
Traveling Expenses .....	200 00	96 69
Premium on Treasurer's Bond .....	12 50	
Insurance .....	50 00	31 00
Certificates.....	75 00	58 50
Section on Scientific Papers .....	25 00	3 17
Section on Education and Legislation.....	25 00	21 41
Section on Commercial Interests .....	25 00	3 17

Section on Practical Pharmacy and Dispensing .....	25 00	23 57
Section on Historical Pharmacy .....	50 00	38 19
A. Ph. A. Bulletin .....	1,415 00	1,309 30
Balance of Salaries for fiscal years 1904-1905-1906 .....	840 00	840 00
Ebert Memorial Volume .....	508 04	508 04
Unexpended Balance .....		622 49
	<u>\$11,395 46</u>	<u>\$11,395 46</u>

## PROSPECTIVE ASSETS.

Not counting what is due from members whose names will probably be dropped from the roll this year, and also from members whose residence is unknown, there was outstanding on the books of the Association, July 1, 1908:

Annual Dues for 1907 .....	\$1,320 00
Annual Dues for 1908 .....	5,715 00
	<u>\$7,035 00</u>

Respectfully submitted,

S. A. D. SHEPPARD, *Treasurer.*

The Secretary also read the following addendum submitted by the Treasurer in connection with his report, following the rule for the past few years:

## ADDENDUM TO THE A. PH. A. TREASURER'S REPORT.

This has been a prosperous year financially. In the list of disbursements there are two items that may be called "extras;" the cost of the Ebert Memorial Volume, \$508.04, and the balance of salaries for 1904, 1905, 1906, \$840.00.

The amount paid out for Proceedings this year was \$1,238.12 more than the previous year, because a heavy bill for expressage and postage was carried over from last year, and the 1907 volume was 126 pages larger than the volume for 1906.

In addition to this we have paid the officers their full salaries this year, and not reduced them 10 per cent., as in three previous years.

We have not used the income from the Life Membership Fund, \$494.09, for current expenses, as in many previous years. The excess of receipts from the sale of National Formulary over disbursements was \$228.82 less than the previous year. The cost of the "Bulletin" should also be considered. It amounted this year to \$1,309.30.

Notwithstanding all these facts, our net cash balance July 1, 1908, exceeds that of July 1, 1907, by \$1,835.45, and the increase in value of the funds during the year was \$3,065.42, making a total of \$4,900.87.

I am pleased to call particular attention to the increase of \$2,237.11 in the Endowment Fund. Let us all help along the good work of this fund by giving something to it, be the amount ever so small, or, if we cannot do that, *let us talk it up*. Talking anything up, especially if the cause has merit, is often a wonderful help to it.

The Ebert Prize was given this year, therefore the amount of that Fund is practically unchanged. The time has not yet come for us to receive from the estate of our beloved friend, Albert E. Ebert, the generous bequest he made to us in his last will and testament.

The several funds, July 1, 1908, are as follows:

Ebert Fund .....	\$941 96
Centennial Fund .....	2248 65
Life Membership Fund .....	16034 55
Endowment Fund .....	2445 31

Total value of above-named Funds, July 1, 1908

\$21670 47

There has been no draft on the Motter Fund. The amount July 1, 1908, was \$27.58.

Four members have been re-instated during the year by payment of all back dues, according to Article I., Chapter VIII, of the By-Laws.

I would repeat, with emphasis, the thought expressed in previous reports, viz.: that the influence of the Bulletin on our work is good, *very good*.

This is my twenty-second and last annual report as Treasurer and it is a great pleasure to be able to report our finances in so normal and healthy a condition.

I thank you all, each and every member, for your uniform courtesy, kindness and help during the past years. May the Association go on steadily to a glorious and useful future, and I most sincerely believe that it will.

Very truly,

S. A. D. SHEPPARD, *Treasurer*.

July 1, 1908.

On motion of Mr. Sayre, of Kansas, the report of the Treasurer and the addendum thereto were ordered received and filed.

Mr. Joseph P. Remington presented a set of resolutions, expressive of the sense of loss of the Association in the voluntary retirement of Treasurer Sheppard from the active service of the Association:

Mr. Sayre and others seconded the resolutions as offered, and they were unanimously adopted.

Tha Chair announced that as it was the intention that these resolutions should be signed by each and every lady and gentleman present, as a special mark of regard for Mr. Sheppard, it was necessary to have some one charged with the duty of securing such signatures, and that Mr. and Mrs. Chas. H. LaWall, of Philadelphia, had kindly offered to do this, and, with the consent of the Association, he would appoint them a committee on signatures.

By consent, the General Secretary read in abstract his report of the financial accounts of the Association, the full text thereof being as follows:

#### REPORT OF THE FINANCIAL ACCOUNTS IN THE CARE OF THE GENERAL SECRETARY.

##### A. RECEIPTS AND EXPENDITURES ON ACCOUNT OF THE NATIONAL FORMULARY, FROM JULY 1, 1907 TO JUNE 30, 1908.

###### I. Receipts.

From Sales and Payment of Bills due July 1, 1907..... \$6,016 88

###### II. Expenditures.

Paper and Press Work, 5,000 copies @ 8.55 cts..... \$427 50

Binding 6,050 copies cloth @ 11½ cts..... \$695 75

Binding 200 copies cloth int. @ 20½ cts..... 41 00

Binding 850 copies sheep @ 28½ cts..... 242 25

Binding 200 copies sheep int. @ 37½ cts..... 75 00

————— 1,054 00

Expressage and Postage..... 354 56

87 Mailing Boxes @ 25 cts..... 21 75

1,120 Mailing Cases for Individual Books @ 1¼ cts..... 14 00

Wrapping Paper, \$2.10; Strawboards \$1.50 ..... 3 60

Telegrams \$0.49; Portorage, \$0.65..... 1 14

————— 1,880 05

*III. Remittances.*

To Treasurer, as per Treasurer's Receipts ..... 6,016 88

*IV. Sales.*

To Dealers and Individuals, as per Ledger Accounts..... 6,037 04

*V. Accounts Unpaid.*

By Dealers ..... 675 75

*VI. Bills Due by the Association.*

For Binding 1,000 copies in cloth (at 11½ cts.)..... \$115 00  
 Binding 150 copies sheep (at 28½ cts. .... 42 75  
 ----- 157 75

*VII. Stock on Hand.*

Copies in flat sheets (unbound) ..... 1,500  
 Copies bound in cloth ..... 835  
 Copies bound in cloth, interleaved ..... 17  
 Copies bound in sheep ..... 155  
 Copies bound in sheep, interleaved..... 36  
 ----- 2,543

**B. SUMMARY OF TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF THE NATIONAL FORMULARY SINCE 1888.**

Receipts to June 30, 1907 (see Proc., Vol. 55, p. 57)..... \$24,820 31  
 Receipts from July 1, 1907, to June 30, 1908 ..... 6,016 88  
 ----- \$30,837 19  
 Expenses to June 30, 1907 (see Proc. Vol. 55, p. 57) ..... \$15,664 91  
 Expenses from July 1, 1907, to June 30, 1908..... 1,880 05  
 ----- 17,544 96  
 Total Receipts from Sale of Physicians' Epitome from June 1, 1900, to June 30, 1908..... 559 62  
 Total Expenses on Account of Physicians' Epitome from June 1, 1900, to June 30, 1908..... 649 45

**C. SALE OF PROCEEDINGS.**

Receipts from July 1, 1907, to June 30, 1908 ..... 96 43  
 Remitted to Treasurer, as per Treasurer's Receipts..... 96 43

**D. TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF SEMI-CENTENNIAL INDEX.**

Total Receipts from July 1, 1903 to June 30, 1907..... \$2,268 47  
 Receipts from July 1, 1907, to June 30, 1908..... 25 90  
 ----- 2,294 37  
 Total Expenses from July 1, 1903, to June 30, 1907..... 3,121 24  
 Expenses from July 1, 1907, to June 30, 1908..... 1 26  
 ----- 3,122 50

**E. ACCOUNT OF BADGES AND BARS.**

Receipts from Sales of Badges and Bars from July 1, 1907, to June 30, 1908. 50 25  
 Remitted to Treasurer as per Treasurer's Receipts..... 50 25  
 Stock on Hand July 1, 1908 ..... Gold Badges, 24; Gold Bars, 82  
 Total Receipts from Sales of Badges and Bars to July 1, 1907  
 (see Proc., Vol. 55, p. 57) ..... \$1,352 30  
 Receipts from Sales from July 1, 1907, to June 30, 1908 ..... 50 25  
 ----- 1,402 55

Total Cost of Badges and Bars to July 1, 1907 (see Proc., Vol. 55, p. 57) ..	1,266 47
Cost of 26 Gold Badges .....	\$48 10
Cost of 40 Gold Bars.....	28 00
Registration Fees .....	56
	<hr/> 76 66

1,343 13

*Baltimore, July 1, 1908.*CHAS. CASPARI, Jr., *General Secretary.*

On motion of Mr. Kraemer the report was received and approved.

The report of the Committee on National and State Legislation was called for, and Mr. Oldberg, chairman, moved that it be referred to the Section on Education and Legislation, to be read at one of its sessions. So ordered.

Mr. England, chairman of the Committee on President's Address, read the following as the report of that committee :

*To the American Pharmaceutical Association :*

*Gentlemen :* Your Committee on President's Address would report as follows :

1. Regarding the statement of President Searby that there are probably 50,000 persons in the United States who are eligible to membership in our Association, we most strongly recommend that a comprehensive systematic campaign be instituted by our Committee on Membership for new members. Immediate steps should be taken to increase our membership, not only among retail druggists, but also among wholesale druggists, manufacturing pharmacists and chemists, teachers of pharmacy, and allied branches in schools of pharmacy and medicine, members of the State Boards of Pharmacy and pharmaceutical journalists. This matter is of the first importance and the Committee on Membership should be given proper financial aid to carry on the campaign.

2. The plan of making the State Pharmaceutical Associations integral parts of the American Pharmaceutical Association has much to commend it, but it is revolutionary, and in our judgment should be most carefully considered. We recommend that the subject be referred to the Committee on Reorganization.

3. We approve the general principle of pre-requisite laws as advocated by President Searby.

4. With reference to the elimination of retail druggists who sell drugs for illegitimate use (cocaine, whiskey, etc.), as noted by President Searby, we most strongly condemn such, and urge that special steps be taken, or inaugurated by our Association to drive all these out of the retail drug business. They are not honest pharmacists; they are only masquerading as such, to the detriment of higher pharmacy, and the injury of honest pharmacists.

5. Concerning parcels-post legislation. This subject is worthy of careful thought and should be referred to a special committee on the subject.

6. So far as the suggestion made that we should concentrate our efforts to secure a faithful carrying-out of the Food and Drug Laws in force, we would say that the laws and regulations appertaining thereto are so many in number that this suggests to us the possible expediency of the American Pharmaceutical Association issuing a Digest of Food and Drug Laws, both national and state, together with federal and state decisions, so that the laws and regulations may be readily ascertained by pharmacists and others. The books should be sold for a reasonable price.

7. We heartily endorse the recommendation that a committee be appointed to obtain additions to the Endowment Fund of the Association.

8. We endorse the position taken by President Searby with reference to the pharmacists of the government service, and recommend that in all legislation regarding such matters the active co-operation of the several departments of government service be secured, if possible.

Respectfully submitted,

J. W. ENGLAND, *Chairman*,  
WM. MITTELBACH,  
H. V. ARNY,  
CHAS. W. JOHNSON,  
JNO. B. BOND, Sr.

The Chair called for action, saying that the report carried with it the appointment of a special committee on parcels post and a committee on endowment fund.

On motion of Mr. Kraemer, seconded by Mr. Wilbert, it was ordered that the report be received and that the recommendations be taken up *seriatim* for consideration and action.

Mr. England, chairman of the committee, read the first recommendation, in regard to the institution of a comprehensive, systematic campaign by the Committee on Membership for new members among the 50,000 eligibles in the United States, according to the President's statement. On motion of Mr. Caswell A. Mayo, as amended by Mr. Wilbert, the recommendation was adopted, with request of the Council to make the necessary appropriation to carry out the plan proposed.

Mr. England read the second item, recommending to refer to the Committee on Reorganization the plan of making the State associations an integral part of this Association. This recommendation was adopted on motion of Mr. Wilbert.

Mr. England read the third item, approving the principle of prerequisite law, without specific recommendation.

The fourth item, condemning the practice of certain retail druggists who sell drugs for illegitimate uses, was referred to the Section on Education and Legislation, on motion of Mr. Mayo seconded by Mr. Wilbert.

The fifth item, concerning parcels-post legislation, and recommending a special committee on the subject, was approved, on motion of Mr. J. M. Good, of St. Louis. The Chair announced that the committee would be appointed later on.

The sixth item, bearing upon the suggestion of the President that efforts should be concentrated to secure the faithful carrying-out of the pure food and drug laws in force, was merely a suggestion as to the possible expediency of the issue by the American Pharmaceutical Association of a digest of such laws, together with Federal and State decisions construing same, and was, on motion of Mr. Wilbert seconded by Mr. Hallberg, referred to the Council for consideration.

The seventh recommendation, that a committee be appointed to secure additions to the endowment fund, brought forth considerable discussion,

participated in by Messrs. Hallberg, Caspari, Jr., Mayo, Searby and Good, as to the best method of procedure and the constitution of the proposed committee, with the final result that a motion by Mr. Hallberg to limit the committee to a membership of fifteen was voted down, and a motion by Mr. Mayo, seconded by Mr. Richardson, that the recommendation be adopted, and that the President be requested at his leisure to name a committee having a representative from each State, Territory or section where the Association has membership, was adopted. The Chair stated that the Committee would be named by the incoming President.

The eighth item was simply an endorsement of the position of the President in regard to pharmacists in the Government service, and contained no specific recommendation. No formal action was taken, and this concluded the report.

Mr. W. L. Scoville, presented the report of the Committee on National Formulary for Chairman Diehl, the report having been prepared by himself, as he stated, as an executive committee of one appointed for that purpose. He said the committee wished to bear testimony to the fact that it was possible to accomplish this work harmoniously and with practical unanimity as to the recommendations made from the fact that, before the meeting, the chairman of the Committee (Mr. Diehl) had prepared a plan of work so complete and systematic as to greatly facilitate the labors of the committee, and enable them to accomplish a great deal of work during the series of special sessions called for Thursday before the meeting of the Association on Monday, and continuing through Friday and Saturday and a part of Monday. The report here follows :

#### REPORT OF COMMITTEE ON NATIONAL FORMULARY.

##### *To the Officers and Members of the American Pharmaceutical Association :*

*Gentlemen :* Your Committee on National Formulary begs leave to report that the consideration of the enlargement and systematic organization of the Committee began in December of last year, and in March of this year ten auxiliary members were nominated and then were appointed by the Council and the whole membership was divided into five sub-committees as has been duly described in the Bulletin.

The Chairman has collected all the criticisms that have been published, and has sent them with other matter to the members of the Committee in ten circular letters covering thirty or forty type-written pages, copies of which are submitted herewith. This matter and the criticisms have had the careful consideration of all the members during the intervening time. The advisability of holding a meeting of the Committee in June was discussed, but it was finally decided to recommend to the Council that a meeting be held at this place prior to the annual meeting of the Association, the Council duly authorizing the holding of this meeting. The proceedings and recommendations of this meeting are as follows :

In accordance with the action of the Council, the National Formulary Committee assembled at Hot Springs, Arkansas, on September 3, 1908. Nine sessions have been held involving about twenty-three hours of executive work, two sessions being held on Thursday, three on Friday, three on Saturday, and one on Monday.

Thirteen of the fifteen members are present, viz: Messrs. Diehl, Hallberg, Hynson, Stevens, La Wall, Army, Beringer, Dunning, Eliel, England, Scoville, Seltzer and Wilbert. The two absent members, Messrs. Cook and Hall, were unable to make arrangements to attend in the brief time which elapsed between the announcement of the Council's action and the time for the meeting, and on this account their absence may be justly excused.

#### STATUS OF THE COMMITTEE.

The Chairman suggested that the appointment of this Committee be made by the Council, which is composed of members who have been familiar with the duties required and the personality of the various committees, rather than by an executive officer who may or may not be cognizant of the fitness of his appointees for carrying out the specific duties required of them.

In accordance with this suggestion the Committee unanimously recommend to the Association that the Committee on National Formulary be appointed by the Council, and that it shall continue until the revision of the Formulary for which it was appointed is completed. It is further recommended that the Committee to be appointed by the Council shall consist of fifteen members.

#### ORGANIZATION OF THE COMMITTEE.

For the present meeting, the auxiliary members of the Committee were placed on an equal footing so far as official action and voting is concerned, with the members of the Committee appointed by the President.

A Secretary pro tem was appointed, but the Committee did not deem it advisable to further change the present organization into sub-committees etc., until after the above recommendation providing for a more permanent committee has been acted upon by the Association. The work is therefore being conducted under the form of organization with which the Association is familiar. It was deemed advisable, however, to secure the future co-operation and advice of the medical profession and of the medical departments of the National Government, and *we recommend* that the American Pharmaceutical Association, through its properly constituted officers, request the Chief of the Bureau of Chemistry, the Surgeon General of the Army, the Surgeon General of the Navy, and the Surgeon General of the Public Health and Marine Hospital Service, to co-operate in the work of revision by supplying such suggestions for additions, corrections or eliminations as may be brought to their attention through or by the physicians and pharmacists engaged in these several services; and that the Chief of the Bureau of Chemistry of the Agricultural Department, and the Surgeon General of the Public Health and Marine Hospital Service, be requested to assist in such laboratory work as may be necessary to improve and perfect the National Formulary and in providing such tests of identity and purity as may be necessary. We suggest that the interest and co-operation of the Medical profession in this work may be best secured through the Joint Conference Committee proposed and provided for by the American Medical Association at the recent meeting of that Association in Chicago. We further recommend that the members of this Conference Committee, to be appointed by the American Pharmaceutical Association, be selected from the membership of the Committee on National Formulary.

#### ERRATA VS. CRITICISMS.

The action of the Chairman in pointing out to certain Government officials that errors in the National Formulary should not be confounded with criticisms of formulas or titles, was indorsed by the Committee.

#### ANALYSIS OF CRITICISMS.

An analysis of criticisms made on the present Formulary by the Chairman is submitted in connection with this report.



## SCOPE AND PURPOSE OF THE FORMULARY.

The scope and purpose of the Formulary is well presented in the preface to the first three editions; and we recommend that the Association continue this as its attitude in regard to the Formulary.

## SHORTCOMINGS OF THE FORMULARY.

Touching the shortcomings, we recommend that conservative action is necessary in connection with the introduction of changes, that the needs of all classes of pharmacists may be met, and that the question of what is or may be a medicinal preparation, or what may be obsolete or poly-pharmaceutical calls for liberal interpretation for the purposes of the Formulary.

## ALTERNATIVE WEIGHTS AND MEASURES.

As was pointed out, that owing to changes in policies on the subjects of weights and measures in successive editions of the National Formulary, much confusion in weights and measures occurred, and consequently a number of errors appear in this regard, due to the fact that the apothecaries' quantities were changed into metric and then subsequently reconverted into their original equivalents, a double liability of error being thus introduced.

After very careful consideration, the Committee *recommends* that the metric system only of weights and measures be used in the National Formulary.

## PERCENTAGES.

Owing to ambiguities in some statements of percentages in the National Formulary, we recommend that whenever it is desirable to state the strength of a preparation, it be stated as containing so many grams of substance in one hundred cubic centimeters, except when all the parts are given by weight, when it may be expressed by per cent.

## ALCOHOLIC PERCENTAGES.

The requirement of the National and State Pure Food and Drug Laws that the percentage of alcohol in medicinal preparations shall be definitely stated on the label has led to the suggestion that the National Formulary add a table or other statement of the alcoholic strength of all the preparations containing alcohol.

This question being beset by a number of difficulties, a committee has been appointed to determine by experiments, whether such a statement in the National Formulary is feasible. If found feasible, the Committee will probably recommend that a statement of this character be incorporated, either under the separate preparations or in tables, as may be advisable. If it is not found feasible to state exact percentages, it may be advisable to state a theoretical strength, and to require simply that the alcoholic contents of preparations containing alcohol shall be within ten per cent. of this theoretical strength, and that slight differences in flavors and colors may be disregarded.

## IDENTITY STANDARDS.

The criticism has been made that the National Formulary contains a number of articles for which there is no recognized standard in the Pharmacopœia or other authoritative works, and that in consequence preparations containing such unofficial articles may vary considerably, owing to commercial variations in the articles sold under the same name. In order to correct this, two methods have been considered. One, to introduce into the Formulary such articles, with tests of identity and standard of strength, as is done in the Pharmacopœia, or, for the present, to briefly define such articles in footnotes, and request the Pharmacopœial Committee to introduce such articles with tests of identity and strength or purity, in the next edition of the Pharmacopœia. It is very probable that any such request would be complied with by the Pharmacopœial Committee. This com-

mittee has deemed it wise to appoint a special sub-committee to collect the data on the number and character of such simples as are not now recognized by authoritative publications before making definite recommendations on the subject.

#### ADJUVANT PREPARATIONS AND COLOR STANDARDS.

The suitability of some of the preparations which are largely used as vehicles or for flavoring and similar purposes, in the Formulary, has been questioned by different critics. Among such questions are the advisability of using saccharin as a sweetening agent, the stability of some of the elixirs, the alcoholic strength of some of the elixirs, and the question of uniformity in color or appearance of various preparations. These are questions needing experimental and any other evidence which may be available, and each has been treated separately and placed in the hands of a special committee. One committee has been charged with the duty of studying the coloring agents and their uses, and if practicable, to recommend some method of standardizing either the coloring agents themselves or the color of the preparations in which they are used.

Another committee has been asked to devise basic elixirs of varying alcoholic strengths which may be used in place of aromatic elixir or other bases when a low alcoholic content in the finished preparations is desirable. Such for instance as the bromide elixir.

The third committee will investigate and report upon the advisability of using saccharin in National Formulary preparations.

#### LIBERTIES TAKEN WITH FOREIGN PHARMACOPŒIAS.

The present Formulary has been criticised because of uncalled-for liberties with the formulas of the British, German and French Pharmacopœias on the ground that a preparation which is intended to be dispensed as identical with or similar to the preparation official in one of these pharmacopœias, should not be changed in any way from the formula of that Pharmacopœia. The deviations in such formulas which have been made in past and present editions, have been made for the reason that ingredients in such preparations vary in the different pharmacopœias, and it is therefore often impracticable to make a foreign preparation with the American galenicals, and have it even similar to the original preparation. It is therefore necessary in many cases to entirely re-arrange the formula and thus produce a preparation which for all medicinal purposes will take the place of the original preparation, but which differs from it in some minor particulars. Your Committee thinks that such liberties are justifiable for the National Formulary, but does not mean by this that such preparations should be dispensed on foreign prescriptions which call for the foreign preparations. We recommend that all formulas in the National Formulary be uniform in style, whether they originate here or are taken from foreign authorities.

#### ELIMINATIONS.

Regarding eliminations, the Committee agrees with the Chairman that the therapeutics or therapeutic incompatibilities of N. F. preparations are not within the province of the National Formulary Committee. The physician may reasonably be expected to know what he wants, and if he chooses to prescribe preparations which are therapeutically incompatible, it is the duty of the pharmacist to supply what is ordered. The Committee therefore feels that it is not justified in dismissing or rejecting any preparation simply because it is stated to be therapeutically absurd, but feels it to be its duty to supply formulas for medicaments which may be prescribed by physicians if the demand for these is sufficient to justify our attention, and if an acceptable formula can be devised or obtained.

*We think that some such statement should be placed in the preface to the next edition of the N. F.* Individual pharmacists may point out the absurdity of some of the combinations and aim to discourage their use and demand, but the physician must decide what he wants, and if his therapeutics are at fault, it is not within the province of the National

Formulary to officially criticise or correct them. Regarding detailed consideration of eliminations from the Formulary, the Committee wishes to act conservatively and the matter has been referred to a sub-committee, which will report on any doubtful article on the basis of actual demand as shown by statistics or other information.

#### ADDITIONS TO THE FORMULARY.

Your Committee agrees with the Chairman that the acceptance of formulas for any new preparation should be based upon considerations of merit in the article, of demand for the same, and upon the reliability of any formula which may be offered. On the other hand, we must be equally careful to omit no meritorious preparations that conform to these requirements. The Formulary may also include and give suitable definitions for all articles that serve as ingredients for preparations described therein, and for which no standard of quality and identification is given in the U. S. P., or for which an authoritative standard may fail to be adequate for a correct recognition, either as to kind or quality.

#### STATUS OF THE APPENDIX.

The Committee has given a careful consideration to this question. The present Appendix is occupied solely with preparations which have been discarded from previous editions of the U. S. Pharmacopoeia, and are not therefore any part of the work of the N. F. Committee; but as the status of the Appendix is not well established, your Committee believes that the best way of meeting this condition is to eliminate the word "Appendix," and to divide the book into two parts, each part to contain such articles as may be appropriately placed therein.

#### PROPAGANDA.

Under this head, the Chairman presented an analysis of the work of pharmacists and the various Sections of the A. Ph. A., which we recommend be referred in its entirety to the Section on Commercial Interests.

#### EXPENSES OF THE COMMITTEE.

In the past, the work of the National Formulary Committee has been wholly gratuitous, but the present legal position of the Formulary makes the work of the Committee more onerous and responsible than it has been hitherto, and we think that the regular expenses of the Committee involving correspondence, use of materials for investigation, and to carry on the work should be met by the Association. Such legitimate expenses may be defined more definitely later, and are not likely to be of any large amount unless by special provision and agreement as in the present case.

#### GENERAL SUBJECTS.

Under this title, a number of details were considered affecting the title of the National Formulary, titles of preparations, etc.

We make the following recommendations.

1. That the title-page of the National Formulary should omit the words "Of unofficial preparations," and the title should be simply "The National Formulary."
2. That the nomenclature and the titles of the N. F. should be in harmony with those of the U. S. P.
3. Titles and synonyms not official should conform to modern ideas of chemistry.
4. Synonyms or English titles should agree with Latin titles.
5. N. F. titles should be descriptive of the true composition of the preparation.
6. The introduction of therapeutic or anatomical names in the future should be prohibited, and we recommend that present therapeutic titles be eliminated as far as is practicable.

7. The method of citing botanical sources and authorities should be made to conform to modern botanical nomenclature.

8. A record of publication should appear on the title-page of the N. F.

9. Trade-mark names should not be introduced into the titles of the N. F.

10. Authority should be given to the Committee to establish a specific date on which the next edition of the National Formulary should go into effect.

11. The "Bulletin" should serve as the official organ of the Committee on National Formulary, and should promptly publish such matters as may be sent to it by the Chairman.

Our Chairman further presented a very complete report on the keeping qualities of N. F. preparations made according to the first edition of the book, and extending over a period of twenty years. This report is available for reference, is of much value, and in the opinion of the Committee should be published in the Proceedings.

The final sessions of the Committee were devoted to a detailed consideration of each separate article in the Formulary. Wherever any change was suggested, either in title, in the formula or in directions for manipulation, the article was referred to its appropriate sub-committee for investigation.

This detailed consideration occupied four full sessions, and no article in the Formulary was omitted from consideration. This work, being unfinished, is not submitted in detail at this time.

Respectfully submitted,

C. LEWIS DIEHL,  
J. W. ENGLAND,  
WILBUR L. SCOVILLE,  
A. B. STEVENS,  
C. S. N. HALLBERG,  
H. P. HYNSON,  
H. V. ARNY.  
LEO ELIEL,  
CHARLES H. LA WALL,  
LEONARD A. SELTZER,  
GEORGE M. BERINGER.  
M. I. WILBERT.

Mr. Kraemer moved to accept with thanks the report of the committee, and to take up the recommendations *seriatim* for consideration and action.

This motion was seconded by Mr. Oldberg, who took occasion to state, first, that he was very much impressed with the amount of valuable labor bestowed by the committee, and then proceeded to draw a clear line of distinction between the proper scope of the Pharmacopœia and the National Formulary, as he understood it. He thought such a book as the Pharmacopœia, of dignity and of definite scope, should be as clean as it is possible to make it, and should contain nothing whatever of complex mixtures or therapeutic combinations, but should contain simples, definite chemical compounds and other preparations of a definite character, for which definite standards can be fixed, leaving to the National Formulary other things that properly belongs there. He did not favor at all, however, the idea of construing the scope of the Formulary in the liberal sense contended for by some and followed by some of the foreign formularies in that particular, by putting into it all mixtures and preparations for which there

is a demand, but which are absurd on their face, thereby making it a laughing-stock among intelligent men. He illustrated the ridiculous extremes to which the "general-demand" idea will lead by citing the case of a certain foreign pharmacopœia, which, in former editions, recognized a solution of acetate of ammonium, commonly called *Spiritus Mindereri*, made out of impure, crude materials then obtainable on the market, but which can no longer be had; and now, in the latest edition, recognizes the same solution made of pure materials—the spirit of Dr. Mindererus having long since gone through a purifying process in purgatory—but then provides that a sufficient amount of Dippel's animal oil be added to the mixture to make it as nasty and dirty as it formerly was! The rule in America should be, simples in the Pharmacopœia, mixtures in the Formulary—but the mixtures in the Formulary should be at least respectable. (Applause.)

Mr. Hynson also seconded the motion of Mr. Kraemer to take up the recommendations *seriatim*, and said he had prepared a synopsis of them, which he would be glad to present, if desired.

#### SYNOPSIS OF RECOMMENDATIONS OF THE N. F. COMMITTEE.

1. The Committee to be appointed by the Council for a full period of revision.
2. The Committee to consist of fifteen members.
3. That the co-operation of the medical profession and the Medical Departments of the National Government be secured.
4. That the present scope of the Formulary, as indicated in the preface, be continued.
5. That conservative action and liberal interpretation be given to the consideration of suitable articles for the Formulary.
6. That the metric system only be used.
7. That strength of preparations be stated as so many grams in one hundred cubic centimeters.
8. That all formulas be uniform in style.
9. That a statement be inserted in the preface to the effect that the National Formulary does not assume any responsibility for the therapeutic value of any preparation, and that the question of additions or eliminations be decided mainly on the basis of commercial demands.
10. That suitable definitions for unofficial ingredients may be inserted.
11. That the term "Appendix" be eliminated and the book designated as parts one and two.
12. That the Chairman's résumé of the propaganda be referred to the Section on Commercial Interests.
13. That the expenses of the Committee be reasonably provided for.
14. The book to be simply "The National Formulary."
15. The nomenclature, titles and synonyms should be in conformity with the U. S. P. or with modern ideas, should be descriptive of composition, and that therapeutic or anatomical titles should be discouraged, (G. S. 2, 3, 4, 5, 6 and 7).
16. Insert record of publication on the title page.
17. Trade mark names shall not be introduced.
18. The Bulletin should serve as the official organ of the N. F. Committee.
19. Authority should be given to the Committee to establish a specific date on which the next edition of the national Formulary should go into effect.
20. The Chairman's report of the effect of age on N. F. preparations exhibited at Detroit 20 years ago, should be published in the Proceedings.

This was agreed to, and the recommendations were thus presented, one at a time, and passed on, with the result that all of the twenty items were adopted, with the exception of the fourth, recommending that the present scope of the Formulary, as indicated in the preface, be continued, which, on motion of Mr. Mayo, after a short discussion, was tabled, and the ninth and tenth items, which, after discussion, were postponed for further consideration—the one, that a statement be inserted in the preface to the effect that the National Formulary does not assume any responsibility for the therapeutic value of any preparation, and that the question of additions or eliminations be decided mainly on the basis of commercial demands; the other, that suitable definitions for unofficial ingredients may be inserted. (Each of these items, the 4th, 9th and 10th, was subsequently adopted, without amendment, at the last general session on Saturday morning.

Coupled with the adoption of the first and second recommendations of the committee's report was the provision for a change in the by-laws to make the recommendations effective.

On motion of Mr. Remington, seconded by half a dozen members, it was ordered that the matter of synonyms in the National Formulary shall be considered at some future meeting.

#### REPORT ON THE EFFECT OF AGE ON THE PREPARATIONS MADE ACCORDING TO THE NATIONAL FORMULARY.

The National Formulary having been successfully launched in 1888, under the able chairmanship of Dr. Charles Rice, and he having declined to continue in this service, it fell to my lot to be appointed chairman of the committee in his place.

With his usual foresight, Dr. Rice had induced a number of practical workers to assist him in the preparation of a line of preparations according to the formulas adopted in the "Formulary," and these preparations, to the number of 285, were displayed in the exhibition connected with Thirty-sixth Annual Meeting, held at Detroit, where they attracted pronounced attention. Subsequently this exhibit was forwarded to me, at Louisville, for preservation and eventual inspection.

The preparations thus entrusted to my care were left intact in their packing cases, and stored in a dry basement until May 10, 1892, when they were opened out, their condition carefully examined, and reported to the Association in 1892, as Part III. of the Report of the Committee on National Formulary. The preparations were then stored in a room adjacent to my store, in closets, protected from light, and during the past year or two, in the Museum of the Louisville College of Pharmacy, protected in a glass case, but exposed to diffuse daylight and to the changes of temperature incident to summer and winter.

Early in July of this year these preparations were again examined, this re-examination including practically all that had been examined nearly sixteen years ago (1892), when they were four years old. A few of the preparations had been lost by breakage, and some others could not be positively identified because the glass labels on their containers had dropped off or had been broken. All of these will be indicated in the following description as "not available."

It is regrettable that no description of the original condition of these preparations, as they appeared when exhibited at Detroit, is available for comparison. Nevertheless, we

were able to form a fair judgment of what their appearance and sensible properties should have been, from the character and quality of their components. If we then review the results of the examination of the specimens as recorded in the Proceedings of 1892 (pp. 99-112), we must be struck with the satisfactory keeping qualities of most of the preparations. It is true that some of them had changed more or less in color, many had formed precipitates—insignificant in most instances—and a few had become unfit for use. But the original flavor in most instances had remained unchanged, and the condition in a large number was found absolutely unobjectionable. Indeed, if, as is done in most pharmacies and manufacturing establishments, the precipitates had been filtered off, after their first appearance, the apparent indication of change would in most cases have been so slight as to be practically disregarded. Furthermore, if it is borne in mind that these preparations, sometimes almost identical, or, at all events, closely alike in composition, were made by different operators, often residing widely apart! that drugs differ among themselves, and are not uniformly obtainable of the same quality! that the personal equation is an important factor! that the formulas are primarily intended for extemporaneous use! and that these preparations were four years old when examined! we must conclude that the "Formulary" supplied formulas that even in this first edition fairly met all demands that could properly be made and expected.

Turning now to the re-examination of these specimens during this year, we should be prepared for serious changes. Sixteen years is a long time for the life of any galenical preparation, and if we add the four years which had passed when the original examination was made, they are now twenty years old. Yet it is a noteworthy fact that many of the preparations exhibit no marked physical changes since 1892, either in color, transparency or precipitation, and that even the aromatic flavors have in some instances remained fairly good. Some have become absolutely worthless; but the largest number have undergone only slight changes apparently since they were first examined, which may be taken as evidence that the principal change took place—in so far as the physical characters of the preparations are concerned—during the first four years of their life.

In the following exhibit the changes noted in the two examinations are given under the respective titles of the preparations, preceded by the serial numbers adopted for them in the first edition of the "Formulary," and followed by the name of the maker, together with the vehicle directed as the basis of the preparation in the case of elixirs, and that which is now directed in the N. F. III—this serving to explain the difference in appearance and changes made in the elixirs of the two revised editions of the "Formulary."

1. *Acetum Aromaticum*. (D. L. Cameron).  
1892. Perfectly clear; pale straw color; odor, excellent; evidently unchanged.  
1908. Unchanged.
7. *Aqua Sedativa*. (Chas. F. Schleussner).  
1892. Clear; decided straw color; slight brownish deposit and some floating crystals of camphor. Color evidently derived from cork.  
1908. No further change apparent.
8. *Balsamum Traumaticum*. (C. R. Paddock).  
1892. Almost absolutely clear; color, deep brown; evidently unchanged.  
1908. No change, other than slight films on bottle.
9. *Bismuthi Oxidum Hydratum*. (Chas. Rice).  
1892. Pure white powder. Unchanged.  
1908. The same.
12. *Caffeina Sodio-Benzoes*. (Chas. Caspari, Jr.).  
1892. Light, nearly pure white powder, readily and completely soluble in water, forming a nearly colorless solution.  
1908. The same.

13. *Caffeina Sodio-Salicylas*. (Chas. Caspari, Jr.)  
1892. Somewhat damp, caked, nearly white powder, with a pinkish tint; readily and completely soluble in water, forming a colorless solution.  
1908. The same.
14. *Carbasus Carbolata*. (C. S. N. Hallberg.)  
1892. Apparently unchanged, though possibly a slight loss of carbolic acid by vaporization.  
1908. Not available.
16. *Ceratum Camphoræ Compositum*. (D. L. Cameron.)  
1892. In good condition; apparently unchanged.  
1908. Not available.
18. *Collodium Iodatum*. (C. A. Rapelye.)  
1892. In good condition; apparently unchanged.  
1908. Gelatinous core, in thin, iodine-colored fluid.
19. *Collodium Iodoformatum*. (C. A. Rapelye.)  
1892. Clear, deep brown; evidently decomposed. (Should be faint yellow.)  
1908. Gelatinous core, within deep-brown liquid.
20. *Collodium Tigllii*. (C. A. Rapelye.)  
1892. Perfectly bright; light brownish-yellow; evidently unchanged.  
1908. The same.
21. *Collodium Salicylatum Compositum*. (C. A. Rapelye.)  
1892. Perfectly bright; deep olive-brown color; apparently unchanged.  
1908. Color deepened. No change apparent.
22. *Cordiale Rubi Fructus*. (Chas. Caspari, Jr.)  
1892. Slightly turbid; small deposit: red color; odor and taste unimpaired.  
1908. Deposit somewhat more decided; otherwise the same. (See 99, Elixir rubi compositum.)
23. *Decoctum Aloes Compositum*. (Chas. Rice.)  
1892. Perfectly bright, dark brown fluid; scarcely appreciable deposit; apparently unchanged.  
1908. The same.
24. *Elixir Acidi Salicylici*. (D. L. Cameron.)  
Vehicle: Aromatic elixir.  
1892. Perfectly clear; color faint brownish-yellow with a reddish tinge; evidently deepened somewhat; odor not so pronounced or pleasant as that of the Aromatic elixir (see 31).  
1908. No further change apparent.
25. *Elixir Adjuvans*. (D. L. Cameron.)  
1892. Turbid, with a slight deposit; color, light brown; odor, good.  
1908. No further change apparent.
26. *Elixir Ammonii Bromidi*. (W. I. Woodman.)  
Vehicle: Adjuvant elixir. (N. F. III: Aromatic elixir.)  
1892. Clear, but considerable deposit; color, reddish brown; odor, good.  
1908. No further change apparent.
27. *Elixir Ammonii Valerianatis*. (W. I. Woodman.)  
Vehicle: Aromatic elixir.  
1892. Clear; no deposit; color, light brown, somewhat pronounced of valerian; otherwise unexceptional.  
1908. Good; no further change.



28. *Elixir Ammonii Valerianatis et Quinina* (W. I. Woodman.)  
 Vehicle: Aromatic elixir.  
 1892. Clear, but small deposit; color and odor same as 27.  
 1908. Changed to deep-brown; heavy precipitate.
29. *Elixir Anisi*. (Chas. Rice.)  
 1892. Clear; nearly colorless; odor excellent; apparently in perfect condition.  
 1908. The same.
30. *Elixir Apii Graveolentis Compositum*. (C. S. N. Hallberg.)  
 Vehicle: Aromatic elixir.  
 1892. Clear; slight deposit; color, light olive brown; odor, good.  
 1908. The same.
31. *Elixir Aromaticum*. (S. J. Bendiner.)  
 1892. Clear; nearly colorless; odor excellent; apparently unchanged.  
 1908. Good in every respect. No apparent change.
32. *Elixir Bismuthi*. (J. M. Good.)  
 Vehicle: Aromatic elixir.  
 1892. Clear; color, deep brown-yellow; small, compact deposit, black, like a metallic sulphide; odor, good but faintly ammoniacal. Evidently changed—possibly by slight excess of ammonia; reaction, alkaline.  
 1908. The same. No further change apparent.
33. *Elixir Buchu*. (J. M. Good.)  
 Vehicle: Adjuvant elixir. (In N. F. III: Aromatic elixir.)  
 1892. Faintly turbid; slight brown deposit; color, deep red-brown; odor, decidedly of buchu. Condition apparently good.  
 1908. Increased deposit; otherwise the same.
34. *Elixir Buchu Compositum*. (J. M. Good.)  
 Vehicle: Adjuvant elixir. (In N. F. III: Aromatic elixir.)  
 1892. Turbid; small brownish deposit; color, brown; odor, good.  
 1908. Not available.
35. *Elixir Buchu et Potassii Acetatis*. (J. M. Good.)  
 Vehicle: Adjuvant elixir (elixir buchu). (In N. F. III: Aromatic elixir.)  
 1892. Faintly turbid; slight, deep-brown deposit; color, deep brown; odor of buchu; apparently good.  
 1908. No further change.
36. *Elixir Caffeina*. (J. M. Good.)  
 Vehicle: Syrup of coffee 4, aromatic elixir 12.  
 1892. Clear; scarcely perceptible deposit; color, yellowish-brown; odor, good.  
 1908. Slightly deeper color—otherwise apparently unchanged.
37. *Elixir Calcii Bromidi*. (J. M. Good.)  
 Vehicle: Adjuvant elixir. (In N. F. III: Aromatic elixir.)  
 1892. Clear, with brown deposit; color, light red-brown; odor, good.  
 1908. No further change.
38. *Elixir Calcii Hypophosphitis*. (J. M. Good.)  
 Vehicle: Aromatic elixir.  
 1892. Clear; nearly colorless; odor good.  
 1908. Clear; color of pale sherry—slight deposit.
39. *Elixir Calcii Lactophosphatis*. (J. M. Good.)  
 Vehicle: Aromatic elixir.  
 1892. Clear; nearly colorless; odor good.  
 1908. Color of pale sherry; otherwise unchanged.

40. *Elixir Catharticum Compositum*. (C. R. Paddock.)

Vehicle: Elix. tarax. co. and elix. licorice. (In N. F. III: Aromatic elixir.)

1892. Clear; scarcely perceptible deposit; color very dark brown; odor unimpaired.

1908. Liquid has thickened somewhat, and the precipitate has also increased some.

41. *Elixir Chloroformi Compositum*. (W. I. Woodman.)

1892. Clear; deep brownish red; good odor; evidently unimpaired.

1908. Turbid; deep-brown; decided deposit.

42. *Elixir Cinchonæ*. (D. L. Cameron.)

Vehicle: (Tincture) Arom. spirit, syrup, water. (Substituted in N. F. III by modified elix. quinine comp., No. 92.)

1892. Clear, but characteristic cinchona incrustation on sides and a slight deposit; color, light brownish-yellow. Odor, not satisfactory, though possibly not changed from original, the peculiar cinchona odor predominating.

43. *Elixir Cinchonæ et Hypophosphitum*. (D. L. Cameron.)

Vehicle: Elixir cinchonæ (42). (In N. F. III, as modified, see 42.)

1892. Clear; slight incrustation on sides, but decided; color, light yellowish-brown; odor, like 42.

1908. Somewhat deeper color and more decided deposit.

44. *Elixir Cinchonæ Detannatum*. (D. L. Cameron.)

Vehicle: (Detannated tincture), otherwise like 42. (Dismissed in N. F. III.)

1892. Clear; insignificant deposit; color, light yellow; odor good.

1908. Clear; small brownish deposit; color, straw-yellow; odor good.

45. *Elixir Cinchonæ et Ferri*. (D. L. Cameron.)

Vehicle: Elixir cinchon. detann. (44.) (N. F. III: Elix. Quin. Co. 92.)

1892. Clear; no deposit whatever; color, light greenish olive; odor, satisfactory.

1908. Color changed to deep brown; copious deposit.

49. *Elixir Cinchonæ, Ferri et Pepsini*. (A. B. Stevens.)

Vehicle: Elix. cinchon. et ferri (45.)

1892. Clear, but slight incrustation on sides and bottom; color light brown (difference from 45 probably due to phosphate of iron used); odor, not satisfactory (of pepsin.)

1908. Dark brown; abundant deposit.

51. *Elixir Cinchonæ, Pepsini et Strychninæ*. (A. B. Stevens.)

Vehicle: Elixir pepsini (81.) (This N. F. III: Arom. elix. and glyc.)

1892. Clear, slight deposit; light yellow; odor, not satisfactory.

*Note:* The color of elixir of pepsin (81) being brownish-red, this is apparently changed by some reaction between the alkaloids and the compound elixir of taraxacum (105) in the elixir of pepsin.

1908. No pronounced change.

54. *Elixir Eriodictyi Aromaticum*. (A. B. Stevens.)

Vehicle: Comp. elixir taraxacum (105.)

1892. Turbid; slight brown deposit; odor good.

1908. No further change apparent.

57. *Elixir Eucalypti*. (E. M. Wells.)

Vehicle: Comp. elix. taraxacum, (105.) and syrup of coffee (353.)

1892. Clear; grey-brown deposit; odor good.

1908. No pronounced further change.

58. *Elixir Euonymi*. (E. M. Wells.)  
Vehicle: Comp. elix. tarax. (105) and syr. coffee (353.)  
1892. Clear; slight deposit on sides; color, deep brownish-red; odor, good.  
1908. Increased deposit; otherwise the same.
59. *Elixir Ferri Hypophosphitis*. (Jul. Kalisch.)  
Vehicle: Aromatic elixir.  
1892. Clear; very slight deposit; color, light brown (Ferri hypophos. evidently changed); odor, good.  
1908. Color deepened considerably; otherwise the same.
60. *Elixir Ferri Lactatis*. (Jul. Kalisch.)  
Vehicle: Aromatic elixir.  
1892. Clear; small whitish deposit; color, deep brownish-yellow; odor, good.  
1908. Color deepened considerably.
62. *Elixir Ferri Phosphatis, Cinchonidinae et Strychninae*. (Jul. Kalisch.)  
Vehicle: Aromatic elixir.  
1892. Clear; scarcely perceptible precipitate; color, deep olive-green; odor, good.  
1908. Not available.
63. *Elixir Ferri Phosphatis, Quininae et Strychninae*. (Jul. Kalisch.)  
Vehicle: Aromatic elixir.  
1892. Clear; but decided precipitate; color very deep olive.  
1908. Color; dark brown; increased deposit.
64. *Elixir Ferri Pyrophosphatis*. (Jul. Kalisch.)  
Vehicle: Aromatic elixir.  
1892. Clear; no deposit; color very light olive-brown (almost yellow); odor good.  
1908. Color deepened to reddish-brown; decided steel-grey precipitate.
65. *Elixir Ferri, Quininae et Strychninae*. (Jul. Kalisch.)  
Vehicle: Aromatic elixir.  
1892. Clear; scarcely perceptible deposit; color olive-brown; very decided deposit.
66. *Elixir Frangulae*. (E. M. Wells.)  
Vehicle: Aromatic elixir and comp. elix. tarax.  
1892. Clear; tolerably abundant, yellowish-brown deposit; color deep brown; odor good.  
1908. No further change, except odor impaired.
67. *Elixir Gentiana*. (E. M. Wells.)  
Vehicle: Aromatic elixir.  
1892. Clear; light brown color (fluorescent); odor good.  
1908. No apparent change.
68. *Elixir Gentianae et Ferri Phosphatis* (E. M. Wells.)  
Vehicle: Elixir gentian (67).  
1892. Clear and bright; fluorescent; color deep brown; odor musty.  
1908. Not available.
69. *Elixir Gentianae cum Tinctura Ferri Chloridi*: Two samples (*a*, E. M. Wells; *b*, D. L. Cameron).  
Vehicle: Elixir gentian (67).  
1892. *a*: Clear, but not bright; fluorescent; scarcely perceptible deposit; color light brown, somewhat deeper than 67; odor good.  
*b*: Slightly turbid; fluorescent, not so decided as in *a*; color darker than *a*; odor good.  
1908. *a* and *b* Both deepened in color; odor good and identical.

70. *Elixir Glycyrrhizæ.* (E. M. Wells.)

Vehicle: Aromatic elixir.

1892. Clear; scarcely perceptible deposit; color deep brown; odor good.

1908. More decided deposit; otherwise apparently the same.

71. *Elixir Glycyrrhizæ Aromaticum.* (E. M. Wells.)

Vehicle: Aromatic elixir.

1892. Turbid; considerable light brown deposit; color brown; odor good.

*Note:* This elixir is inferior in all respects to "Elixir Glycyrrhizæ" (70), probably because fluidextract is used in it in place of "purified extract" and ammonia.

1908. No further change apparent.

72. *Elixir Grindeliæ.* (Chas. F. Schleussner.)

Vehicle: Comp. elix. tarax. (105).

1892. Clear; scarcely any deposit; color brownish-red; odor good.

1908. No further change apparent.

74. *Elixir Humuli.*

Vehicle: Aromatic elixir and comp. elix. tarax. (105).

1892. Slightly turbid, brown deposit on sides and bottom; color deep red-brown; odor, good.

1908. No further change apparent.

75. *Elixir Hypophosphitum cum Ferro.* (J. Blair.)

Vehicle: Aromatic elixir and syrup.

1892. Perfectly bright; color, faint yellowish; odor, fairly good. Apparently little if any change.

1908. Not available.

77. *Elixir Lithii Bromidi.* (O. P. Hare & Co.)

Vehicle: Adjuvant elixir. (N. F. III: Aromatic elixir.)

1892. Turbid; considerable precipitate; color, light reddish-brown; odor, fair. (See note under 78.)

1908. No further change apparent.

78. *Elixir Lithii Citratis.* (Owens and Miner Drug Co.)

Vehicle: Adjuvant elixir. (N. F. III: Aromatic elixir.)

1892. Nearly clear, no deposit; color, light reddish-brown; odor, good.

*Note:* This and 77 should be alike in keeping qualities. 77 contains 30 grains citric acid in a pint; 78 contains none. There is a marked difference in the odor of the two; but this is possibly due to the adjuvant elixir.

1908. No further change apparent.

79. *Elixir Lithii Salicylatis.* (C. A. Santos: F. N. Masi.)

Vehicle: Adjuvant elixir. (N. F. III: Aromatic elixir.)

1892. Clear; faint deposit; color, reddish-brown, but darker than either 77 or 78; odor, like 77, but not identical.

1908. No further change apparent.

80. *Elixir Maltæ et Ferri.* (C. A. Santos: W. B. Saul.)

Vehicle: Aromatic elixir.

1892. Turbid; considerable precipitate on sides and bottom; color, brown; odor, good.

1908. Not available.

81. *Elixir Pepsini.* (A. B. Stevens.)Vehicle: Alcohol 3, glycerin 2, co. elix. tarax. 1, sugar and water to 16.  
(N. F. III: from glycerite, with aromatic elixir.)

1892. Clear; nearly bright; no deposit; color, brownish-red; odor, fairly good.  
1908. No further change apparent.

82. *Elixir Pepsini Bismuthi et Strychnina*. (A. B. Stevens.)

Vehicle: Elixir pepsin and bismuth (83).

1892. Clear; small whitish deposit; color, brown-yellow; odor, fairly good.  
1908. Not available.

83. *Elixir Pepsini et Bismuthi*. (A. B. Stevens.)

Vehicle: Same as elixir of pepsin (81.)

1892. Opalescent; small grey-white deposit covered on surface with a scum of black-grey matter; color, very light olive-brown (lighter in appearance than 82); odor, fairly good.

*Note*: The difference in appearance of 82 and 83 is difficult to account for. Presuming that 82 was made from the identical 83, the assumption would appear to be reasonable that the strychnine sulphate has exercised preservative action.

1908. Not available.

84. *Elixir Pepsini et Ferri* (A. B. Stevens.)

Vehicle: Elixir of pepsin (81).

1892. Clear; almost bright; no appreciable deposit; color, brownish-red, as is 81, from which it is directed to be made; odor, fairly good.

*Note*: The odor of all the pepsin elixirs (51, 81, 82, 83, 84) is deficient on account of the small amount of elixir of tarax. co. (1:16), the sole aromatizing ingredient.

1908. Color changed to dark brown and abundant deposit has formed.

85. *Elixir Phosphori* (Chas. Rice).

Vehicle: Aromatic elixir and glycerin.

1892. Clear and bright; nearly colorless; good odor; evidently unchanged.

1908. Perfectly clear; faintly straw colored; odor faintly aliaceous.

86. *Elixir Phosphori et Nucis Vomica* (Chas. Rice).

Vehicle: Elixir phosphori (85).

1892. Clear; bright; nearly colorless; apparently unchanged.

1908. Slight straw color; odor, slightly aliaceous; otherwise unchanged apparently.

87. *Elixir Picis Compositum* (C. A. Santos: W. B. Saul).

Vehicle: Wine of tar (433) and syrups.

1892. Turbid; decided brown, pulverulent deposit; color, light brown; odor tarry.

88. *Elixir Pilocarpi* (C. A. Santos).

Vehicle: Elix. tarax. comp. (105).

1892. Nearly clear; slight deposit; color, deep brown; odor, good.

1908. Increased deposit; otherwise the same.

89. *Elixir Potassii Acetatis* (J. Clifton Wheat, Jr.)

Vehicle: Aromatic elixir.

1892. Perfectly bright; faint straw color; odor, good.

1908. Color slightly deepened; otherwise the same.

90. *Elixir Potassii Acetatis et Juniperi* (Robert Brydon).

Vehicle: Aromatic elixir.

1892. Slightly turbid; small, resinous deposit; color, brown-yellow; odor, good.

1908. Clear (evidently owing to separation of deposit, which is apparently larger); otherwise no change.

91. *Elixir Potassii Bromidi* (S. D. Craik).

Vehicle: Adjuvant elixir. (N. F. III = aromatic elixir).

1892. Nearly clear; considerable deposit; color, deep brownish-red; odor, well preserved.

1908. No further change.

92. *Elixir Quinina Compositum*. (Chas. Rice.)

Vehicle: Aromatic elixir.

1892. Clear and bright; no deposit; faint straw color; odor good.

1908. Not available.

95. *Elixir Rhamni Purshiana*. (E. L. Milhau.)

Vehicle: Elix. tarax. comp. (105) and elix. glycyrrhizae (70). (N. F. III: from arom. fluidextract with arom. elixir.)

1892. Nearly clear; slight deposit; color deep brown; odor good.

1908. Decided deposit; otherwise good.

96. *Elixir Rhamni Purshiana Compositum*. (E. L. Milhau.)

Vehicle: Syrup, water, aromatic spirit, co. tr. cardam. (N. F. III: Arom. elixir, etc.)

1892. Nearly clear; slight deposit; color deep brown; odor good (better than 95).

1908. Somewhat increased deposit, but not as much as 95.

97. *Elixir Rhei*. (E. L. Milhau.)

Vehicle: (Sweet tr. rhubarb, U. S. P., -8-) glyc., alc., syr., water.

1892. Clear; very slight, yellow deposit; odor agreeable.

1908. No perceptible change.

98. *Elixir Rhei et Magnesiae Acetatis*. (E. L. Milhau.)

Vehicle: Aromatic elixir.

1892. Nearly clear; decided brown deposit; color deep brown-red; odor good, but not so pleasant as 97.

1908. Not available.

99. *Elixir Rubi Compositum*. (E. L. Milhau.)

Vehicle: Blackberry juice, syrup, dil. alcohol.

1892. Turbid; considerable red deposit; color deep red; odor good.

1908. Changed decidedly; evidently some fermentation; odor bad.

100. *Elixir Sodii Bromidi*. (E. L. Milhau.)

Vehicle: Adjuvant elixir. (N. F. III: Aromatic elixir.)

1892. Nearly bright; no deposit; color very light yellow-brown; odor good.

1908. No material difference apparent.

101. *Elixir Sodii Hypophosphitis*. (E. L. Milhau.)

Vehicle: Aromatic elixir.

1892. Perfectly bright; no deposit; nearly colorless; odor good.

1908. Very faint deposit; color yellow or light orange; odor fair.

102. *Elixir Sodii Salicylatis*. (E. L. Milhau.)

Vehicle: Aromatic elixir.

1892. Perfectly bright; no deposit; pinkish-straw color (very light salmon color); odor good.

1908. No material change apparent.

103. *Elixir Stillingia Compositum*. (E. L. Milhau.)

Vehicle: Aromatic elixir.

1892. Nearly clear; faint deposit; color brown; odor very good.

1908. No change apparent.

104. *Elixir Strychninae Valerianatis*. (E. L. Milbau.)  
 Vehicle: Aromatic elixir.  
 1892. Clear and bright; no deposit; color rose-red; odor good.  
 1908. Slight valerian odor; no other apparent change.
105. *Elixir Taraxaci Compositum*. (S. J. Bendiner.)  
 Vehicle: Alcohol, syrup, water. (U. S. III: Aromatic elixir.)  
 1892. Slightly turbid; very faint deposit; color, brown; odor, good.  
 1908. No material change apparent.
106. *Elixir Turnerae*. (Henry Schmid.)  
 Vehicle: Aromatic elixir.  
 1892. Nearly clear; very slight deposit; color, light brown; odor, good.  
 1908. No apparent change.
107. *Elixir Viburni Opuli Compositum*. (Henry Schmid.)  
 Vehicle: Comp. elix. tarax. (105).  
 1892. Nearly clear; decided, but not large deposit, of a light brown color; color, deep red-brown; odor, good.  
 1908. No apparent change.
108. *Elixir Viburni Prunifolii*. (Henry Schmid.)  
 Vehicle: Aromatic elixir and co. tr. cardam.  
 1892. Turbid; decided, but not large precipitate on sides and bottom; color, light reddish-brown; odor, good.  
 1908. Not available.
109. *Elixir Zinci Valerianatis*. (Henry Schmid.)  
 Vehicle: Aromatic elixir.  
 1892. Perfectly bright; no deposit; color, light red-brown; odor, good.  
 1908. No apparent change.  
*Fluidextracts*: 32 different specimens, made by J. P. Remington, F. B. Power, and J. M. Good.  
 These are taken collectively; with few exceptions they have not undergone any pronounced change since they were examined in 1892; the precipitates, when present, have become more compact, and it is therefore difficult to form a judgment regarding increase. It is safe to say that if the precipitates had been filtered off, or the clear fluidextracts decanted as is done by manufacturers generally, they would be very presentable preparations to-day. Among them the following exceptions may be noted:
137. *Extractum Calendulae Fluidum*. (J. P. Remington.)  
 1892. Nearly clear, with a small, oily super-stratum and a slight, gray-brown deposit; color, deep yellowish-brown. Condition satisfactory.  
 1908. A decided deposit; color, deepened.
138. *Extractum Camelliae Fluidum*. (F. B. Power.)  
 1892. Clear, with a small olive-gray, caked deposit; color, deep red-brown. Condition satisfactory.  
 1908. Large gelatinous deposit.
141. *Extractum Coffea Toste Fluidum*. (F. B. Power.)  
 1892. Clear, with a very slight brown deposit; color, dark brown; odor, very good. Condition satisfactory.  
 1908. Odor somewhat impaired; taste characteristic.
168. *Extractum Senna Fluidum Deodoratum*. (F. B. Power.)  
 1892. Clear, with abundant black, smeary deposit adhering to one side and to bottom; color, deep brown; odor, fairly good.  
 1908. Compact deposit, amounting to about one-sixth the entire volume.

181. *Gelatinum Chondri*. (Chas. Rice.)  
 1892. Had kept well.  
 1908. Apparently as good to-day as when first made.  
*The Glycerites*, made by Henry Schmid (184 & 185), A. B. Stevens (186), and Chas. Rice (187), have not undergone any further change apparently, with the single exception possibly of
186. *Glyceritum Pepsini*. (A. B. Stevens.)  
 1892. Perfectly bright, with faint flocculent deposit, easily floating through the liquid; color, deep straw-yellow; odor, not pleasant.  
 1908. Perfectly clear, but color deepened to light brown.
189. *Gossypium Stypticum*. (Chas. F. Schleussner.)  
 1892. Condition satisfactory.  
 1908. No change apparent.
190. *Infusum Gentiana Compositum Fortius*. (Chas. F. Schleussner.)  
 1892. Turbid, with slight fawn-colored deposit; color, brown, odor, good.  
 1908. Not available.
192. *Iodoformum Aromatisatum*. (Chas. Rice.)  
 1892. Odor (of cumarin) satisfactory.  
 1908. Odor, the same.  
*The Liniments* (195-201, made by C. R. Paddock): These, with possibly a single exception, were found practically satisfactory in 1892, and are so now with the following exception:
198. *Linimentum Saponato-Camphoratum*. (C. R. Paddock.)  
 1892. Of four samples (in opodeldoc bottles, rubber stoppers), three were perfectly preserved. The fourth was yellow, owing to imperfect stopper.  
 1908. All the samples had liquefied more or less completely, forming clear, yellow-brown liquids in which white saponaceous masses floated.
199. *Linimentum Terebinthina*. (C. R. Paddock.)  
 1892. Separated slightly, but easily re-emulsionized on shaking, condition satisfactory.  
 1908. Separation more decided, but easily mixed by shaking, condition, fair.  
*The Liquors*. (202 to 241) made by Emlen Painter, Chas. Rice, F. B. Power, Chas. F. Schleussner, A. B. Stevens, C. S. N. Hallberg, J. U. I.loyd and L. F. Stevens. These were either in good condition or showed no further change, with the following exceptions:
207. *Liquor Bismuthi*. (Emlen Painter.)  
 1892. Clear, faintly opalescent, with insignificant deposit; colorless; odor, faintly alcoholic.  
 1908. Opalescent and colorless but a very decided white deposit.
215. *Liquor Ferri Hypophosphitis*. (F. B. Power.)  
 1892. Clear, with very little deposit; color, olive-green.  
 1908. Turbid; color, greenish olive-brown.
218. *Liquor Ferri Protochloridi*. (F. B. Power.)  
 1892. Bright clear; color, greenish, with faint yellowish tinge.  
 1908. Decomposed; brown liquid, with a deposit of yellowish matter adhering to the shoulder and bottom of bottle.
225. *Liquor Morphina Hypodermicus*. (Chas. Rice.) Two specimens: *a*, in blue g. s. poison bottle; *b*, in flint g. s. bottle.  
 1892. *A*. Clear; small deposit; faint straw color.  
 1908. *A*. Color, reddish. Otherwise, no apparent change.



1892. *B.* Clear; small deposit; color decidedly darker (a brownish straw-color) than *A.*

1908. *B.* Incrustation in shoulder and decided deposit; color, reddish, deeper than *A.*

235. *Liquor Sodii Boratis Compositus.* (Chas. Rice.)

1892. Opalescent, with very small fawn-colored deposit; faintly colored.

1908. Clear, with white film adhering to the sides of bottles; color, pale salmon-yellow.

242-303. None of the preparations included between these numbers, which specimens were examined in 1892, have undergone any change worth mentioning. Concerning the

*Granular and Powdery Effervescent Preparations.* The following general remarks may here be made: They include

11. *Coffeine Citras Effervescens* (L. C. Hopp).

178. *Ferri et Quinina Citras Effervescens* (L. C. Hopp).

180. *Ferri Phosphas Effervescens* (L. C. Hopp).

304. *Potassii Bromidi Effervescens* (L. C. Hopp).

305. *Potassii Bromidi Effervescens cum Caffeina* (L. C. Hopp).

306. *Potassii Citras Effervescens* (L. C. Hopp).

323. *Sal Carolinum Factitium Effervescens* (L. C. Hopp).

325. *Sal Kissingense Factitium Effervescens* (L. C. Hopp).

327. *Sal Vichyanum Factitium Effervescens* (L. C. Hopp).

528. *Sal Vichyanum Factitium Effervescens cum Lithio* (L. C. Hopp).

These were shown in the examination of 1892 to be elegant preparations.

The granular products were well formed, and had in most instances retained fairly good effervescent qualities; the powdery products were usually somewhat caked, in some instances slightly damp, and in general did not effervesce quite as briskly as their granular form. They exhibited no discoloration.

Re-examined in 1908, they had practically lost their effervescent properties, though slight elimination of carbon dioxide was still observable on dissolving them in water. The granular forms had also dampened somewhat, but the granules could still be shaken asunder; the powdery forms were slightly more damp and caked than in 1892. In some instances the pure white of the products had changed to a cream-like tint, but decided discoloration was observed only in the effervescent caffeine citrate, both granules and powder having assumed a light brownish color—an effect which was noted in its incipency in the granules in 1892.

No material changes have been noted in the re-examination of the specimens from 329-353. These include 12 *Spirits* (from 335-346), only one of which has probably deteriorated in a marked degree, though not unexpected, namely:

344. *Spiritus Phosphori.* (Chas. Rice.)

1892. Bright; colorless; odor of phosphorus. Reaction faintly acid.

1908. Clear, colorless, brownish deposit; aliacious odor.

On the other hand it is a pleasure to note how well the aromatic spirits have kept, the following being apparently as good to-day as when they were first made:

336. *Spiritus Amygdalæ Amara.* (T. D. McElherrie.)

337. *Spiritus Aromaticum.* (Chas. Rice.)

338. *Spiritus Aurantii Compositus*. (Chas. Rice.)  
 339. *Spiritus Cardamomi Compositus*. (T. D. McElherrie.)  
 340. *Spiritus Curassao*.

This is the more important in view of the fact that they are some of the primary or stock preparations, upon which dependence is placed for the expeditious or extemporaneous preparation of many of the preparations of the "Formulary."

Among the thirty formulas for *Syrups* (354-384) the following are the only changes that are noteworthy:

354. *Syrupus Calcii Chlorohydrophosphatis*. (Chas. Rice.)  
 1892. Slightly turbid, with small brown deposit; color, light brown.  
 1908. Considerable deposit; color, very dark brown.
355. *Syrupus Calcii et Sodii Hypophosphitum*. (E. L. Milbau.)  
 1892. Bright clear; nearly colorless.  
 1908. Clear, but color deep brown-red.
364. *Syrupus Ferri et Mangani Iodidi*. (F. B. Power.)  
 1892. Clear, with slight fawn-colored deposit; color, pale and straw-yellow.  
 1908. Color changed to reddish-brown.
367. *Syrupus Ferri Protochloridi*. (F. B. Power.)  
 1892. Bright clear; nearly colorless, with greenish tint.  
 1908. Color changed to deep orange.
370. *Syrupus Hypophosphitum Compositus*. (C. A. Rapelye.)  
 1892. Clear, with slight deposit; color straw-yellow; otherwise good.  
 1908. Darkened and unfit for use.
373. *Syrupus Morphinae Compositus*. (C. A. Rapelye.)  
 1892. Somewhat turbid; viscous; color, brown.  
 1908. A clear, gelatinous mass, forming a core surrounded by comparatively little thin fluid.
376. *Syrupus Pectoralis*. (Chas. Rice.)  
 1892. Somewhat turbid, but free from deposit; nearly colorless; odor, good.  
 1908. Color, light salmon-brown; odor of sassafras.
382. *Syrupus Sennae Compositus*. (Chas. Rice.)  
 1892. Clear, with some deposit; color, deep brown; good odor.  
 1908. Decided deposit; otherwise the same.

The remaining preparations, consisting of *Tinctures* (386-418), and of *Wines* (424-435), have not changed materially from the conditions in which they were found in 1892.

In conclusion, it may be remarked that the faults in the formulas of the first edition of the National Formulary (1886), are not glaring. Some of these faults have been corrected in the revised editions of 1896 and 1906 and a new revision, now contemplated, will doubtless correct others. We may aspire to produce a "Formulary" that shall assure a reasonable degree of uniformity and reliability for its preparations; but, for the reasons pointed out in the beginning of this article, our expectation that any book of formulas, however correct, will secure absolute uniformity of the products obtained under the directions, will prove quite as disappointing as the chasing of a "will-o'-the-wisp."

C. LEWIS DIEHL, *Chairman Com. on N. F.*

Louisville, Ky.

Mr. Good called attention to the special order set for 12 o'clock this

day, viz.: the discussion of the resolutions offered in the Council by Mr. Beal, of Ohio, and read yesterday as a part of the minutes of the Council, providing for the creation of a Committee on Standards of Non-Official Drugs and Chemicals, and indicated the hour as having arrived. Thereupon the Chair declared the special order before the convention for discussion and action, and called on Secretary Whelpley, of the Council, to read the resolutions again, which he did as follows:

*Resolved*, 1. There shall be a standing committee of the Council to be known as the Committee on Standards of Non-Official Drugs and Chemical Products, consisting of ten members elected by the Council, but the members of such committee need not be members of the Council.

2. The first committee shall be constituted as follows: 2 representatives from firms engaged in the manufacture of chemicals, 2 representatives from firms engaged in the manufacture of pharmaceuticals, 2 representatives from firms engaged in the wholesaling of drugs and chemicals, 2 retail druggists, and 2 representatives from the faculties of colleges of pharmacy.

3. The committee shall prepare from existing sources of information, a tentative list, subject to revision, correction and extension by this Association of the principal drugs, chemicals and medicinal preparations not recognized by the United States Pharmacopœia arts, with a suitable system of nomenclature for the same, and shall adopt suitable limits of strength and purity therefor.

4. The chairman of said committee shall be designated by the Council, and the committee shall report progress annually.

5. The committee first chosen shall serve for one year, and at the next annual meeting of the Council shall report upon a plan for the permanent organization of the committee, and also upon a plan for the permanent continuance of the work.

A long discussion followed the reading of the resolutions.

Mr. Hallberg led off in the discussion, and said that he, for one, did not understand the purport of the resolutions entirely. He feared that there would be a conflict between the work of this proposed committee and that of the Sub-Committee on National Formulary, engaged in a similar work as to articles entering into National Formulary preparations. It looked like duplication and confusion.

The General Secretary said that as he understood the matter the committee of ten was to prepare a tentative list only of the principal drugs, chemicals and preparations not recognized by the Pharmacopœia, and to submit this next year for revision and correction; and, based on that list and the work of the committee during the ensuing year, further work of the committee would be determined. After that tentative list has been prepared, it can be compared with the work of the Sub-Committee on National Formulary, and thus all confusion be avoided.

Mr. Beal, the mover of the resolutions in the Council originally, said the suggestions made in these resolutions had grown out of his experience as Drug Inspector in the State of Ohio. He was requested by the Food and Dairy Commission to act as Drug Inspector, and he consented on condi-

tion that he could resign whenever he wanted to. He wanted an opportunity to study the retail pharmacist on his native heath, so to speak, and to get closer to him than he had been able to do for a number of years. In this work a great many questions concerning the administration of the law naturally arose. The laws in effect all provide, in substance, that when an article is sold under or by a title recognized by the U. S. Pharmacopœia, National Formulary, or other standard work of *materia medica*, it must comply with the requirements of such standard, or it is adulterated. It is this "other standard" which causes the difficulty. Say it is proposed to prosecute a druggist or other person for the sale of an inferior or adulterated article: The officers of the law know in advance what authority they are going to rely on to establish the adulteration. They appear in the court and prove that that particular work is an accepted standard. The defendant knows nothing about it, and is at a great disadvantage, naturally, in his effort to establish another standard. If we had a list of such things prepared by this Association, the body of men of all others best fitted to fix such standards, then the pharmacist would have an authority which would hardly be questioned by court or jury.

It is not proposed that the committee shall make the standard, but simply that they shall do the preliminary work and present it to the Association for its final approval or disapproval, or for its rejection entirely. He thought it would be a great mistake if this Association did not attempt this very important work. It would not conflict with the U. S. Pharmacopœia, the National Formulary, or the work on *materia medica* of the American Medical Association. These bodies will present their several reports, and if the report of this committee shall be found to include something already cared for by the National Formulary Committee, for instance, it can be eliminated from this particular list.

In the judgment of the speaker, this was a very important subject, and one which will vitally affect the interests of this Association and its membership, as well as that of the retail druggists at large, and this first tentative step should be taken now. If there is anything good in it, it will show up as the work proceeds; and if it has no value, it can be discontinued.

Mr. Hynson spoke briefly in favor of the adoption of the resolutions. He could see no conflict between the two committees, or chance of confusion there, and thought the proposed committee might be of some assistance to the National Formulary Committee.

Mr. Asher, of New Orleans, spoke in favor of the resolutions also. He thought this a step in the right direction, and said that druggists are frequently at sea as to what standard to follow. He moved that the "recommendation be adopted in toto," and Mr. Hallberg seconded this motion.

Mr. Edwin DeBarr, of Oklahoma, thought this was a scheme to shift the burden of labor that attached to the Committee on U. S. Pharmacopœia

to somebody else, because it "was too big a job for them." He criticised the make-up of the committee in its proportionate distribution of membership between manufacturers and wholesalers on the one side and the retail druggists and pharmaceutical faculties on the other, the representatives of the former having a heavy majority as proposed, and took the position that such a committee was unnecessary and undesirable, and that the Committee on U. S. Pharmacopœia was the proper one to fix "standards of weights and measures."

Mr. Remington thought Mr. De Barr misconceived the situation; this was not a committee to fix standards of weights and measures, but standards for preparations which are unofficial—articles which, though used in drugstores and called for by physicians, are not official in the U. S. Pharmacopœia or considered by the National Formulary. He thought this the proper body to take up the important question of these unofficial preparations, and aid in this great movement sweeping all over the country to establish standards to relieve the pharmacists, as well as the courts, from this trouble of uncertain standards. The first question is to determine the scope of this new work, if undertaken by this Association, and he thought that that question should be referred to a sub-committee, to thoroughly consider the subject and bring in a report at some future meeting of the Association.

Mr. Asher, in arguing for this motion, said that Mr. De Barr evidently misunderstood the real scope of the proposed committee, which would be entirely different from that of the Committees on U. S. Pharmacopœia and National Formulary, as it is to consider only such things as are not official in either the Pharmacopœia or Formulary. Moreover, the committee is to report only a tentative plan, and if not feasible the Association need not, and will not, adopt it.

Mr. De Barr responded that he did not mean to confine his remarks to the proposition of standards for weights and measures to all. He objected to a multiplicity of committees, and thought the creation of this committee would lead to confusion.

Mr. Geo. M. Beringer requested that the resolutions be re-read, in order that the members might have a clear understanding of what they were expected to vote upon.

Mr. Hallberg again read the resolutions.

Mr. A. B. Stevens approved of the arrangement here proposed as admirable, and thought it could not be improved upon. He thought it would be absurd to place this work in the hands of the Committee on U. S. Pharmacopœia. This committee is to be taken from a source especially interested in this subject, and can bring it before the Association in a way the Pharmacopœial Committee could hardly do with the work it has in hand. He repelled the suggestion that the members of the Committee on Pharmacopœia were trying to shirk their duty in this matter: in his experience, they were about the best body of workers he knew.

Mr. Hallberg also thought Mr. De Barr was not familiar with the real situation. The Pharmacopœial Committee is a committee elected from delegates to the Decennial Convention, and has representatives from the medical societies, colleges, etc. This matter could not be brought before the Pharmacopœial Committee of Revision at the present time, as in his judgment the organic law of the Pharmacopœial Convention would not permit the Committee on Revision to engage in this work. He thought it was up to the American Pharmaceutical Association to demonstrate its ability to deal with this question.

Mr. Chas. E. Vanderkleed thought light could be thrown upon the object of this committee by referring to the fact that the Council of Pharmacy and Chemistry of the American Medical Association had already taken up this very line of work, and a committee such as is proposed would find a field for operation in co-operating with that Council committee.

Mr. Hynson believed the only objection to this matter was the constitution of the committee, and he could not see what the pharmaceutical faculties had to do with a matter of this kind. They are no more experts than chemists in this particular work. He thought the members of faculties should be stricken out, and that it should be made four retail druggists instead. He made a motion accordingly, that these representatives on the committee be not necessarily members of faculties, and that there be substituted four retail druggists.

Mr. Good said he appreciated the force of the objection to the composition of the committee. The point was raised yesterday that two manufacturing chemists, two manufacturing pharmacists and two wholesale druggists were to be put on the committee, and this would make six of the committee of ten practically interested in putting goods on the market. He thought the trouble with the committee could be obviated by making it a committee of thirteen, with five retail druggists on it, letting the two members of pharmaceutical faculties remain; then there would be seven against six, a preponderance against those directly interested in pushing articles of a low standard. He moved accordingly, that the committee be changed to thirteen members, arranged as at present, with the exception of substituting five retail druggists for the two named in the resolutions. Mr. Hynson accepted this as a substitute for his motion, and seconded it.

Mr. John M. Francis was emphatically of the opinion that the houses engaged in the manufacture of pharmaceutical preparations and chemicals were just as much interested in the quality of the goods sold as any other body of men, and he repelled the suggestion that they were not.

Mr. Good said his remarks were not made as an insinuation, but to overcome that objection to the composition of the committee.

Continuing, Mr. Francis said that, as he understood it, the first task

before the committee would be to make a list of unofficial preparations, or of the chemicals and drugs which entered into the composition of these pharmaceutical preparations—not that they shall establish standards—and present them to the Association at the end of one year. The Association then would have a perfect right to approve or reject the work of the committee. Certainly, no body of men are better fitted to make up such a list—not standards—than those who are engaged in the manufacture of these things.

Mr. Remington said that the Committee on Revision of the United States Pharmacopœia had had frequent meetings with the manufacturers of chemicals and pharmaceutical preparations, and with wholesale druggists, and had received from them most valuable information. There was no attempt on their part to fix standards, and he apprehended that the proposed committee would not have the slightest desire to do so. He did not think the American Pharmaceutical Association, in the light of its experience with the Revision Committee, need have the slightest fear that any manufacturer would get his preparation in and under consideration for advertising purposes, if that was what was in the minds of some of the members. He did not believe this Association would select a committee that could be approached or used by any manufacturer whatever. The Pharmacopœial Committee and the National Formulary Committee—and this other committee—want to hear from these very men who are making these preparations. He thought if it was possible for this Association to do anything to exercise a control of any kind, direct or indirect, over the vast horde of irregular preparations on the market, it would be doing a great work.

Mr. Good, speaking to the reference made to the work done by the committee appointed by this Association and the American Medical Association, said that everybody knew of the admirable work done by that council, and everybody knew as well that many of the preparations put on the market by trade names would be represented to this committee, and it should be in a position to do the right thing—particularly in view of the reports that have come from this Council; therefore, he saw an additional advantage in making this committee a little larger, and not putting the majority in the hands of men who are manufacturers. Considering the many fake things thrown on the market, he did not think they should have too much to say as to the recognition of such preparations or products by this committee.

Mr. A. M. Roehrig said that Mr. Beal had given this matter a great deal of serious thought, the result of his experience as drug inspector of a great state, and he believed his opinion should have great weight; that he had looked into this matter very carefully, and had decided who should compose this committee, and he moved as a substitute to the motion before the house the adoption of the recommendation as read in the resolutions. Several members seconded this motion.

Mr. Hynson called attention to the amendment offered by Mr. Good, that the committee should consist of thirteen members, five of whom were to be retail pharmacists. He had no personal interest to subserve, but he wanted to see the retail pharmacists well represented, and he hoped the substitute motion of Mr. Roehrig would not prevail.

Mr. Beal said the make-up of the committee was merely suggestive on his part. He thought that, finally, a larger committee would be desirable, but he feared to propose too large a committee at first, for fear of increasing opposition. He would like to move, if in order, to increase the membership of the committee to fifteen—to get away from the “unlucky number thirteen,” as suggested by a member, and to make the number of retail druggists five, with four representatives from the faculties.

Mr. Stevens opposed Mr. Beal's motion; he did not want the Association to go on record as opposed to the “superstitious number, thirteen!”

Mr. Payne seconded the motion of Mr. Beal, as he thought it was only right to give this recognition to the retail pharmacists; it would also add power to the recommendation.

Mr. Roehrig, also, was inclined to support Mr. Beal's motion, provided he would withdraw his remarks reflecting on the number thirteen. He had been a member of a “Thirteen Club” in New York for a number of years past, and never had had such good luck. (Laughter.) Mr. Beal very amiably consented to this.

Mr. Good here withdrew his amendment to make the committee thirteen instead of ten, and accepted the substitute motion of Mr. Beal to make it fifteen.

The Chair then put the vote on Mr. Beal's substitute motion to make the membership of the committee fifteen, with five retail druggists instead of two, and four members of pharmaceutical faculties instead of two, and it carried unanimously.

Mr. Hynson then moved the adoption of the resolutions, as a whole, as amended, and the motion was seconded and carried.

Mr. C. Lewis Diehl, of Louisville, here submitted his report as Reporter on the Progress of Pharmacy, reading the introductory remarks only, and the report was referred to the Committee on Publication on motion of the General Secretary.

Mr. Geo. F. Payne presented the report of the Committee on the Status of Pharmacists in the Government Service, with certain resolutions accompanying it, which he read. The report and resolutions here follow:

*Whereas*, In nearly all the branches of the United States Navy, the warrant officers, after six years service, are promoted to chief grade, with pharmacists as an exception Therefore, be it

*Resolved*, That this Association earnestly endorses the efforts of the Hon. Victor Metcalf, Secretary of the Navy, and of Dr. P. M. Rixey, Surgeon-General of the Navy, to secure for naval pharmacists the grade of Chief Pharmacist, and heartily approves such



further recognition of pharmacists in all the branches of the public service, as will bring them into fuller professional recognition, in regard to their tremendous responsibilities, and the increasing scientific requirements demanded by our National Laws. And, be it further

*Resolved*, That a copy of this resolution be sent to the President of the United States, to the Secretary of the United States Navy, and to the Surgeon-General of the United States Navy.

REPORT OF THE COMMITTEE ON STATUS OF PHARMACISTS IN THE  
ARMY, NAVY, AND PUBLIC HEALTH AND MARINE HOSPITAL  
SERVICE OF THE UNITED STATES.

This committee has been and still is forced to report more or less progress. This position is due chiefly to tactical legislative causes. We were promised influential aid after the Medical Emergency Bill was enacted, and the Medical Department fully organized. In the meantime, however, several of our organizations became impatient, and in their zeal to force progress, they introduced several bills to Congress which are still in their respective committees.

Your committee recommends that a movement be encouraged to concentrate legislative committees into a composite body for the purpose of holding a conference at one of our national conventions, preferably the American Pharmaceutical Association, for the purpose of drafting a broad Act and settling upon a general plan of national organization. Our committee will contribute its share of service in any needed direction in a cooperative movement, and whatever plan may be adopted by the conferees, it must have as active participants in any advisory capacity, the presidents of every State Pharmaceutical Association.

We believe that an initiative movement on new lines is advisable. We have been very patient and now that a medical staff, after several years' agitation, has received its just demands, we must commence to actively advocate and plead for a proper status for pharmacists in the service of the United States Army, Navy, Marine Hospital Service and our National Guard. There is no question but what we will ultimately succeed if we exercise our power nationally. Our influence is great and our cause most worthy. All that is needed is an intelligent and well-directed united effort maintained with persistency and aggressiveness. There is no doubt that we can induce Congress to concede to our profession officer's rank, its emoluments and concessions. Our plan should be based on a general pharmaceutical formation, embracing the entire service with equal pay for land or sea service. When a comprehensive plan has been formulated and the details carefully adjusted, it should be approved by the President of every Pharmaceutical Association and placed in the hands of a special committee to select its defenders in the Senate and the House of Representatives.

Resolutions should be annually passed by our State Pharmaceutical Associations demanding proper recognition until we succeed. Now that nearly every other profession has been recognized in the U. S. Service, it is about time we demand it for pharmacy.

Respectfully submitted,

GEORGE J. SEABURY, *Chairman*,  
J. H. BEAL,  
GEORGE F. PAYNE.

Mr. Remington moved that the report be received and that the resolutions just read be adopted, and Mr. Mayo seconded this motion.

In response to a suggestion from the Secretary as to the desirability of including in the request for advancement in grade the Public Health

Service also, as well as the Navy, Mr. Payne said the resolutions embraced that proposition.

The motion of Mr. Remington was then adopted.

Mr. Hynson moved that the report of the Committee on "Bulletin" be read by title only, and referred to the Council. Mr. Mayo seconded the motion and it was carried.

Mr. Hynson then moved that the amendments to the By-Laws submitted by him yesterday morning be adopted, and this motion was seconded by Messrs. Mayo and Meissner and adopted.

The changes in the By-Laws thus adopted were as follows :

#### AMENDMENTS TO THE BY-LAWS.

Chapter VIII, Article III. Insert the words "Editor of the Bulletin" after the words "Reporter on the Progress of Pharmacy" in second line.

This amendment is intended to make the editor of the "Bulletin" an ex-officio member of the Council.

Chapter VII, Article VII. Add a new clause to read as follows :

"Whenever deemed advisable by the Council, it shall after the publication of each edition of the National Formulary appoint a committee of fifteen members from the general membership of the Association, which committee shall have charge of the revision of the Formulary. This committee shall report annually or as often as required to the Council and shall continue to serve until the edition for which it was appointed has been completed. Vacancies occurring in this committee shall be filled by the Council as quickly as is expedient."

This amendment is in accordance with the report and recommendation of the committee on National Formulary.

Mr. Hallberg presented a communication from the chairman of the trustees of the Ebert estate, and moved its reference to the Council. He said it represented that there would be about \$5,000 coming to the Association from that estate upon final settlement.

The motion to receive and refer was seconded by Mr. Mayo and carried.

Mr. Remington moved to adjourn, subject to call of the President. He said he did this in view of the considerable amount of unfinished business properly belonging to this session, which it was impossible to dispatch now, as the hour was late.

Mr. Mayo seconded this motion, and it carried.

The convention thereupon stood adjourned, subject to call of the President.

---

#### THIRD SESSION—TUESDAY AFTERNOON, SEPTEMBER 8, 1908.

No business was transacted by the Association previous to the first session of the Section on Commercial Interests.

**FOURTH SESSION—WEDNESDAY MORNING, SEPTEMBER 9, 1908.**

No business was transacted previous to the first session of the Section on Education and Legislation.

---

**FIFTH SESSION—WEDNESDAY AFTERNOON, SEPTEMBER 9, 1908.**

No business was transacted previous to the second session of the Section on Education and Legislation.

---

**SIXTH SESSION—WEDNESDAY EVENING, SEPTEMBER 9, 1908.**

No business was transacted previous to the third session of the Section on Education and Legislation.

---

**SEVENTH SESSION—THURSDAY MORNING, SEPTEMBER 10, 1908.**

No business was transacted previous to the first session of the Section on Scientific Papers.

---

**EIGHTH SESSION—THURSDAY AFTERNOON, SEPTEMBER 10, 1908.**

No business was transacted previous to the second session of the Section on Scientific Papers and the second session of the Section on Commercial Interests, held simultaneously.

---

**NINTH SESSION—FRIDAY MORNING, SEPTEMBER 11, 1908.**

No business was transacted previous to the first session of the Section on Practical Pharmacy and Dispensing, and the single session of the Section on Historical Pharmacy.

---

**TENTH SESSION—FRIDAY AFTERNOON, SEPTEMBER, 11, 1908.**

No business was transacted previous to the second session of the Section on Practical Pharmacy and Dispensing.

---

**ELEVENTH SESSION—FRIDAY EVENING, SEPTEMBER 11, 1908.**

An adjourned session of the second general session of Tuesday morning, provided for conditionally at the time, was held Friday evening, upon call of the President, and was called to order at 8 : 30 o'clock, with President Searby in the chair.

The Chair stated that the first order of business would be the reading of the minutes of the Council by the Secretary of that body. Mr. Whelpley thereupon proceeded to read the minutes of the fifth session, held September 7, 1908 :

#### FIFTH SESSION OF THE COUNCIL.

EASTMAN HOTEL, HOT SPRINGS, *September 9, 1908.*

Called to order at 9 : 30 a. m., by Chairman Beal, with the following present: Messrs. Apple, Beal, Caspari, Jr., Eberle, Eisele, Eliel, England, Godbold, Howell, Keith, Lemberger, Oldberg, Roehrig, Searby, Whelpley and Wilbert.

Applicants for membership, Nos. 253 to 258 inclusive, were duly elected.

The following officers of the Association were then unanimously elected :

*General Secretary*—Charles Caspari, Jr., Baltimore, Md.

*Reporter on Progress of Pharmacy*—C. Lewis Diehl, Louisville, Ky.

*Treasurer*—Henry M. Whelpley, St. Louis, Mo.

Vice-Chairman Roehrig was called to the chair, and the following motion offered :

" Moved by J. H. Beal, seconded by M. I. Wilbert, that it be the sense of the Council that every pharmacy, drug store, public hospital or dispensary or other public institution where drugs and medicines are prepared or dispensed, should be provided with a copy of the latest edition of the United States Pharmacopœia and National Formulary, and that all state pharmacy laws should contain a requirement to that effect."

The motion carried.

On motion, the Council adjourned to 9 a. m. Thursday.

On motion of Mr. Asher, seconded by Mr. Payne, the minutes of the Council were approved as read.

Mr. Whelpley then read the minutes of the sixth session of the Council, held September 10th.

#### SIXTH SESSION OF THE COUNCIL.

Eastman Hotel, September 10, 1908. Called to order at 9 : 30 a. m. by Vice-chairman Roehrig, with the following present: Messrs. Caspari, Jr., Eberle, Eisele, Eliel, England, Howell, Keith, Lemberger, Oldberg, Roehrig, Searby, Whelpley, Wilbert, Beal, Apple and Godbold.

The minutes of the fifth session of the Council were read and approved.

The following motion was then presented and discussed by Messrs. Beal, Oldberg, Caspari, Jr., Wilbert, Apple, Hallberg, Lemberger, Searby, Whelpley and Eliel.

Moved by J. H. Beal, seconded by H. M. Whelpley.

1. That we extend fraternal greetings to the National Association of Retail Druggists, shortly to convene at Atlantic City, New Jersey, and wish that organization abundant success in every effort which it may make to elevate the dignity and honor of American Pharmacy and to secure for those who follow that calling a degree of commercial prosperity and financial reward that shall be proportionate to their educational acquirements, and to their moral and legal responsibilities.

2. That there be appointed a special Committee on Relations with the National Association of Retail Druggists, said committee to consist of three members and to take into consideration the means whereby each association may strengthen the hands of the other in its special lines of activity, and to render more fruitful the measures of reform and progress which are common to the purposes of both organizations.

3. That it is suggested to said committee that it consider the advisability of selecting a common meeting place for the annual conventions of both associations, and the selec-

tion of such dates for the same as will permit, at least, the sessions of the commercial section of this association to be contemporaneous with the final general session of the National Association of Retail Druggists.

4. That all determinations and recommendations of the said committee shall be reported to the Council for consideration and disposal.

5. That a copy of these resolutions shall be forthwith transmitted to the executive officers of the National Association of Retail Druggists.

The motion was adopted.

The following was presented :

COMMUNICATION FROM THE EXECUTORS OF THE EBERT ESTATE.

CHICAGO, September 1, 1908.

*To the Council of the American Pharmaceutical Association :*

The executors of the estate of Albert E. Ebert expected to make a final report at this meeting, but owing to delay caused by certain legal details it was not possible to have the final action taken in the Probate Court at this time. The status is at present as follows :

There is now no outstanding claim against the estate as is shown by the accompanying abstract of the cause. There is cash on deposit in the Illinois Trust and Savings Bank, a little over \$3,000 with accumulated interest. There is a balance of \$700 to be received for the sale of the lots in Austin. This amount being in escrow pending final action of the court confirming the sale of the lots for \$2,200. There remains to be disposed of the jewelry appraised at \$600, and the lot in Winnetka valued at \$1,000. From this will be deducted the commission on the sale of the lots, the lawyer's fees and court costs, amounting to a total of about \$300, leaving a balance of about \$5,000.

The Chicago Veteran Druggists' Association at a meeting sometime ago appointed a committee consisting of the executors and Mr. W. Bodemann, to arrange for a monument, and also for a fund of \$300 for the permanent care of the graves. It was decided that the Council be asked to allow this sum of \$300 from the residue of the estate, while the Chicago Veteran Druggists' Association will erect a monument estimated at \$500 to \$600 out of the \$1,000 which it now has on hand as subscription to the Ebert Fund, the disposition of the remainder of this fund being left for future consideration.

In the hope that this information will be of interest to the Council, we are,

Very truly,

THOS. N. JAMIESON,

C. S. N. HALLBERG,

*Executors of the Estate of Albert E. Ebert.*

Moved by J. H. Beal, seconded by C. S. N. Hallberg.

That the communication from the executors of the Ebert estate be received and spread upon the minutes of the Council, and that the request of the said executors to appropriate \$300 for the purpose of arrangement for the permanent care of the graves of Albert E. Ebert and his wife be granted, and that the executors be authorized to enter into contracts for that purpose.

Motion carried.

The following was presented :

REPORT OF THE COMMITTEE ON THE BULLETIN.

*To the American Pharmaceutical Association :*

The "Bulletin" has appeared regularly, 3,000 being printed monthly of which about 500 have been sent to druggists in various localities whose names were furnished by the Membership Committee.

Very few applications for membership can be traced to these sample copies but since 2,300 are now required for the mailing list and since this list is gradually increasing it is

recommended that the printing of 3,000 every month be continued as the saving in printing of a few hundred less would be nominal. Besides securing new members is facilitated after the candidate has been receiving the "Bulletin."

The total expense for the year slightly exceeds that of last year being as per enclosed statement \$1,250 exclusive of the \$200 paid the Editor. It is recommended that an appropriation of \$1,500 be made for the 12 months' total expenses of the "Bulletin" in lieu of any balance unexpended from the past year's appropriation.

Owing to the difficulty in deciding from what source to secure the large sum required (\$500 to \$600) to defray the cost of the publication of 40,000 "Bulletins" the "Pre-Convention Bulletin" published in August, 1906 and 1907, was not attempted this year. While no doubt sending the "Bulletin" practically to every drug store in the U. S. once every year acquaints the rank and file with the aim, objects and work of the A. Ph. A., it had apparently but little effect of adding to the membership or increasing attendance at the annual meetings. It is therefore recommended that no attempt be made to cover the entire trade next year but that an addition of the "Pre-Convention Bulletin" to cover the larger cities not to exceed 20,000 copies may be published should this seem to be desirable to the Committee and the cost of such publication be approved by the Council.

The "Bulletin" for September is devoted exclusively to the program for the annual meeting and it is hoped that it may be appreciated by the members to have in one compact volume convenient for reference everything pertaining to the various Sections, etc., and that without any additional expense to the Association. No doubt if this year's experiment proves successful Section officers and members generally will promptly furnish the information desired so as to insure the most timely and complete publication. To avoid confusion and delay in the collection of the necessary data it is suggested that the Chairman of each Section should be held responsible for the program, although he may delegate its collection and arrangement to the Secretary.

The only complaint made by the Editor is that the officers of the Association do not use the "Bulletin" more freely for such announcement and notices as they may desire to and should make during the intervals of the meetings in order to create and maintain interest in the work. The Committee beg to remind the members that the "Bulletin" is theirs and that the Editor is always ready to cooperate in anything that pertains to the Association and its work.

The Committee has no further specific recommendation except that the Editor, possibly in conjunction with the Secretary of the General Committee on Membership, should employ a stenographer and institute a systematic campaign for membership as soon as a sum of six hundred dollars annually could be provided for that purpose. No doubt the gain in membership would more than compensate for such expenditure.

The Committee approves the publication plan submitted by the Editor provided such can be effected by individual subscription without cost to the Association.

Respectfully submitted,

H. P. HYNSON,

H. M. WHELPLEY,

C. S. N. HALLBERG,

*Committee on the "Bulletin."*

*Hot Springs, Ark., September 7, 1908.*

## STATEMENT OF EXPENSES OF THE BULLETIN, SEPT., 1907, TO AUG., 1908, INCLUSIVE.

1907.			
September.	3,000 Bulletins.....	\$114 48	
	Credited by additional contributions to pre-convention number .....		28 09
			<hr/> \$86 39
October	3,000 Bulletins.....	114 20	
November.	3,000 Bulletins.....	98 50	
December.	3,000 Bulletins.....	105 23	
1908.			
January.	3,000 Bulletins.....	101 83	
February.	3,000 Bulletins.....	100 22	
March.	3,000 Bulletins.....	108 69	
April.	3,000 Bulletins.....	103 17	
May.	3,000 Bulletins.....	101 38	
June.	3,000 Bulletins.....	107 52	
July.	3,000 Bulletins.....	103 94	
August.	3,000 Bulletins.....	120 49	
			<hr/>
Total.....		\$1,251 56	

## PUBLICATION PLAN.

*To the American Pharmaceutical Association:*

With the movement for reform on the *Materia Medica* and rational Therapeutics there is need for a medium through which the physicians may be kept thoroughly informed on official pharmacy as well as be made as promptly acquainted with the latest advances in pharmaceutical art and practice.

While there are hosts of medical journals, more or less devoted to therapeutics, the subject of official pharmacy either receives little attention or it is obscured by articles on pathology, hygiene, sanitation and on the many surgical specialties which may be of more immediate interest or importance to the medical reader than the treatment of ordinary disease.

Again the general practitioner is a busy man and even those who receive the big weekly journals often do not have time to read more than some one or more of the leading articles until the next week's journal appears when the older journals are forgotten.

There are also many physicians who seldom receive any other journals than such as are published by medicine manufacturers and whose *materia medica* is limited often to their own manufactures.

A journal about the size and style of the *A. Ph. A. Bulletin* devoted to acquainting physicians with official pharmacy—the Preparations of the U. S. P. and the N. F.—the relations of these works and their importance to the medical profession and the necessity for co-operations of pharmacists and physicians in their improvement and perfection is demonstrated in the joint work in the revision of the *Pharmacopoeia* and in the American Medical Association.

It would comprise a department of Therapeutics containing seasonable Formula and record such New Remedies, Therapeutics, Agents and Preparations, as may appear from reliable sources.

It would record Joint Meetings of Physicians and Pharmacists, give abstracts of papers and discussions as far as practicable and serve as an organ between the Branches of the Association and the Medical Societies.

Coming only once in three months, its contents would be more likely gleaned than the more frequently appearing journals, and treating exclusively of Pharmaceutical Therapeu-

tics, it would be in a class of its own and be widely read because containing the very information that the busy practitioner is looking for.

It is proposed to publish such Journal "Therapeia," for gratuitous circulation by subscribers to physicians in their respective localities.

Since such journal would not be eligible for 2nd class postage rates it would be sent by mail to the subscribers who would supply it to physicians direct.

The following is the estimated cost:

1 copy quarterly, \$1.00 per year; 10 copies quarterly, \$5.00 per year; 25 copies quarterly, \$10.00 per year.

Should this be approved it is desired to prepare the first number, so that it may appear early in October dated November, 1908.

Respectfully submitted,

C. S. N. HALLBERG.

*Chicago, September 1, 1908.*

On motion by J. W. England, seconded by F. M. Apple, the report of the Committee on Bulletin was adopted.

Moved by Jas. H. Beal and seconded by Chas. Caspari, Jr., that the officers of the Association be instructed to execute a quit-claim to Emily J. Koltz in connection with the sale of two lots of land belonging to the estate of the late Albert E. Ebert, as reported by the executors of the Ebert estate.

Motion carried.

On motion of E. V. Howell, seconded by H. M. Whelpley, the session of the Section on Historical Pharmacy was changed from 8:30 p. m., Friday, to 10 a. m., Friday.

Applicants for membership, Nos. 259 to 264, inclusive, were duly elected.

On motion, the election of a Committee on Food and Drugs Standards was made a special order for 9 a. m., Friday. A committee of three was appointed to canvass names for membership on the committee and to report to the Council. J. H. Beal was made chairman of the committee and selected Oscar Oldberg and Charles Caspari, Jr., as associates.

J. W. England referred to the Council a request of the Section on Education and Legislation to print in the Bulletin in full the report of the Committee on National and State Legislation and to send a copy of the report to each pharmacist in the United States.

On motion by J. H. Beal, seconded by J. L. Lemberger, the Council Committee on Publication was instructed to have a suitable number of reprints made of the Report of the Committee on National and State Legislation and see to the judicious distribution of said copies.

On motion by Leo Eliel, seconded by E. G. Eberle, the sum of \$750.00 was ordered paid the Chairman of the Committee on National Formulary for services rendered since the Kansas City meeting of the A. Ph. A.

On motion of F. M. Apple, seconded by Oscar Oldberg, the sum of \$240.00 was appropriated for the use of the Committee on Membership and the editor of the "Bulletin" in carrying out a systematic campaign for new members, this amount to be used for stenographic services.

On motion the council adjourned.

The Chair stated that, without objection, the minutes would stand approved as read, and it was so ordered.

Mr. Whelpley read the minutes of the seventh (and last) session of the Council, held this day, September 11th.



SEVENTH SESSION OF THE COUNCIL.—EASTMAN HOTEL, HOT SPRINGS, ARK., SEPT. 11TH.

Council called to order at 9:30 a. m., by Vice-Chairman Roebrig, with the following members present: Messrs. Apple, Beal, Caspari, Jr., Eberle, Eliel, England, Godbold, Lemberger, Oldberg, Roebrig, Searby, Whelpley, Wilbert and Eisele.

The minutes of the sixth session of the Council were read and approved.

On motion, applicant for membership No. 265 was duly elected.

The following report of the Committee on Unofficial Standards was submitted by Chairman Beal and adopted by the Council:

#### REPORT OF THE COMMITTEE ON UNOFFICIAL STANDARDS.

The committee appointed to nominate fifteen members for the Committee on Unofficial Standards hereby respectfully submits the following names:

*Manufacturing Chemists*—Thomas P. Cook and Edward Mallinckrodt.

*Manufacturing Pharmacists*—John M. Francis and C. E. Vanderkleed.

*Wholesale Druggists*—George B. Kauffman and M. N. Kline.

*Retail Druggists*—H. P. Hynson, George M. Beringer, O. Raubenheimer, J. M. Good and Leo Eliel.

*Pharmaceutical Faculties*—Richard Fischer, Charles E. Caspari, W. A. Puckner and J. A. Koch.

The report was signed by Messrs. Oldberg, Caspari, Jr., and J. H. Beal (Chairman).

On motion, the Secretary of the Council was instructed to notify the members of the committee of their appointments and request the acceptance of each member.

On motion by H. M. Whelpley, seconded by J. W. England, the Committee on Publication was instructed to insert the list of past officers in the 1908 volume of Proceedings.

Moved by J. H. Beal, and seconded by Oscar Oldberg, that Article I, Chapter III, be amended by striking out the figures "1000" and inserting in lieu thereof the figures "1200."

The motion carried.

On motion by J. H. Beal, seconded by Leo Eliel, the General Secretary was instructed to turn over to the treasurer elect, H. M. Whelpley, the check for \$1,000 contributed to the Endowment Fund of the A. Ph. A. by retiring treasurer, S. A. D. Sheppard.

On motion by H. M. Whelpley, a committee of three was authorized to arrange the details of transfer of the treasurership. Vice-Chairman Roebrig named the following committee: J. H. Beal (Chairman), J. G. Godding and Linville H. Smith.

On motion by J. L. Lemberger, seconded by J. P. Remington, Chairman Beal of the Committee on Transfer of Treasurership, was authorized to visit Boston for the purpose of arranging the details of the transfer, his expenses to be paid by the Association.

On motion by C. S. N. Hallberg, seconded by M. I. Wilbert, one hundred dollars was appropriated for the use of the Committee on United States Pharmacopœia.

On motion, it was decided to suspend the By-Law which relates to the Section on Scientific Papers for the ensuing year.

On motion by Oscar Oldberg, seconded by H. M. Whelpley, a committee of three was named to draft a rule of finance governing the care of invested funds. The Chair named J. H. Beal, J. L. Lemberger and Joseph P. Remington.

On motion, the Council adjourned to meet for re-organization, Saturday, at 9 a. m.

The Chair stated that, without objection, the minutes would stand approved as read, but Mr. Beal suggested that in view of the fact that the Council recommended certain changes in the By-Laws, it would perhaps be better if the minutes were approved by formal vote, and he so moved, that the minutes of the seventh session of the Council be approved as read.

This motion was seconded by Mr. Lemberger and carried.

An opportunity was here given Mr. Whelpley to make some announcements as to time and place of meeting of the Committee on Reorganization, the desirability of the signing by the members present of the Constitution and By-Laws, etc.

The General Secretary, referring to the minutes of the Council just read and adopted, said he thought it was due the Association that he should state that the action of the Council in increasing the Secretary's annual compensation in the sum of \$200 was as much of a surprise to him as it could be to the members, and he had learned from the mover of the resolution (Mr. Beal) that it was done to place the Secretary's office in a position to secure additional assistance.

The President spoke of the increase of work devolving upon the General Secretary's office by reason of the growth of the Association and the elaboration of the work of the Sections, and felt sure the members generally would recognize the justice of increasing that officer's compensation accordingly.

The President then stated that Dr. C. Travis Drennen, of Hot Springs, ex-President of the Arkansas Medical Association, would now address the Association in behalf of the American Medical Association, in the absence of Dr. Stephenson, of Little Rock, chairman of the delegation from that body to this.

Dr. Drennen responded handsomely to this invitation, and spoke at length, extending the fraternal greetings of the American Medical Association in a very happy and friendly manner. He was disposed to throw verbal bouquets at the pharmaceutical fraternity, and made a good-tempered, half-humorous address that pleased and amused the members. Among other things, he graphically told the story of how an intelligent and careful pharmacist had held up and prevented fatal result from a genuine prescription calling for *drams* of strychnia instead of grains, written by a careless physician. He paid his respects to the "proprietary evil," and frankly confessed that the shelves of druggists were filled with these things because the physicians too freely prescribed them. He knew of no class of men whose interests were more absolutely interdependent than those of the honest doctor and the honest pharmacist. He closed with a plea to the members of the Association to assist in getting the Government interested in the idea of a "Greater Hot Springs," to the end that the field of usefulness of this already noted national sanitarium may be vastly extended. He painted in glowing colors the Hot Springs of the future, as its citizens would like to see it.

At the invitation of the Chair, Dr. J. C. Minor, of Hot Springs, extended the fraternal greetings of the Garland County - Hot Springs Medical Society in a very cordial manner, and assured the members that his society was heartily in sympathy with the work of this Association—"as all good doctors should be with such good people."

The President called on Mr. Joseph P. Remington to reply to the addresses of welcome and fraternal greeting just made.

Mr. Remington was fully equal to the task thus unexpectedly imposed upon him, and began by expressing gratification at the presence of these representatives of the medical profession. He made an eloquent plea for the restoration of the prescription—in recent years almost a lost art—first to the physician, then to the pharmacist. "We want the medical profession of the United States to get back to writing prescriptions that are fitted to the particular case," he said in ringing terms. (Applause). The physician loses the confidence of his patient when he writes a prescription for a medicine that the patient knows he can get at any department store at a cut-rate price. The prescribing of proprietary remedies and preparations has come about by slow degrees as the result, largely, of apathy, indifference and negligence on the part of the physician, rather than by design, though the pharmacists themselves are not entirely blameless for present conditions. He was glad to say, however, that a great change for the better seems now to be imminent, from the astonishing revolution going on all over the country as the result of the Pharmacopœial and National Formulary propaganda recently inaugurated.

One thought he would suggest as to proprietary remedies was this: Both doctors and physicians know that, in the treatment of ordinary disease, it is rare that the same undeviating, inflexible medicinal agent is proper at all stages of the disease—at the beginning, in the middle and during convalescence; and it should be borne in mind that the proprietary medicine does not change, therefore it is not dealing fairly with the patient to give him such treatment. The patient has the right to demand of his physician that he shall treat his case intelligently and skilfully, so as to bring about his recovery in the surest and quickest manner, and he is defrauded in his rights by the prescribing of these proprietary remedies. Not only so, but the physician who handles a case skilfully, and according to the demands of its varying stages, creates a most favorable impression on the patient, and adds to his reputation.

He paid his respects to so-called "drugless therapy," and closed with an amusing story to illustrate the predicament in which he found himself here, by reason of the unexpected call of the President upon him to respond to the remarks of these medical gentlemen who had preceded him, by telling of the negro preacher,—known to be fond of his "toddy,"—in Philadelphia, recently, during the time of the temperance wave that has been sweeping over the city, who, upon being asked the pointed question by one of his deacons as to whether he was in favor of or against prohibition, diplomatically responded, "Does you mean that for an investigation or an invitation?"

The Chair called for the report of the Committee on Time and Place of Next Meeting, and Mr. Frank Schachleiter, of the committee, in the

absence of Chairman Kirkland, presented the following report, showing that the members of the committee present were hopelessly divided, two and two :

#### REPORT OF COMMITTEE ON TIME AND PLACE OF NEXT MEETING.

*Mr. President and Gentlemen of the Association :*

We, your Committee on Time and Place beg leave to report receipt of the following invitations :

From the city of Cincinnati, Ohio; from the city of Richmond, Va.; from the city of Atlantic City, N. J.; from the city of Seattle, Washington; from Salt Lake City, Utah; from the city of Cedar Point, Ohio; from the city of Los Angeles, California.

After carefully considering the same, during four meetings of our committee, we acknowledge ourselves hopelessly divided, standing 2 in favor of Cedar Point and 2 in favor of Los Angeles. After much deliberation we respectfully submit to the Association the names of the two cities, from which to select the place of meeting for 1909.

We further recommend the last week in August as the most desirable and convenient time for holding this meeting.

Respectfully submitted,

FRANK SCHACHLEITER, *Chairman.*

On motion of Mr. Payne, of Atlanta, the report was received and opened for discussion.

First Vice-President Oldberg was called to the Chair, in order that President Searby, as the leader of the California contingent, might take the floor and present the claims of the city of Los Angeles for the honor of the next meeting-place.

The presentation of this report at once precipitated a lively but good-natured discussion, extending over a period of an hour or more.

Mr. Henry P. Hynson led off, as chairman of the delegation to the forthcoming meeting of the National Association of Retail Druggists at Atlantic City next week, charged with the duty of trying to bring about the closest relationship possible between this Association and the N. A. R. D., and if possible to arrange for a common time and place of meeting next year. Mr. Hynson objected to the selection of any particular place of meeting at this time, as he feared it would hamper the delegation in its efforts, and moved to refer this question to the Council. Several members seconded this motion.

Mr. F. W. Meissner, Jr., as a member of the same delegation, spoke in support of Mr. Hynson's motion, and advanced practically the same reasons for its adoption.

Mr. Payne moved to lay this motion on the table, and was seconded by Mr. Eberle, of Texas, but consented to withdraw it at the suggestion of Mr. Beal, of Ohio, who made a plea for discussion of the main proposition. Mr. Payne explained that this was the idea he had in mind in making the motion, to admit of general discussion.

Mr. A. M. Roehrig thought that at least the sentiment of the members

present might be taken as to their preference for a meeting-place next year, so the N. A. R. D. Delegation would know what that preference was.

This brought the discussion up to the concrete question as to what place should be selected, and Mr. Searby, of California, led off with a strong plea for the city of Los Angeles, presenting the advantages and attractions of that city in a most skilful and persuasive manner. The cause of the Pacific Slope was also ably championed by Messrs. Remington, Johnson, Whelpley, Mayo, Roehrig, Payne, Dewoody and Mrs. Fletcher Howard.

Mr. Beal, as a loyal son of Ohio, presented the claims of Cedar Point, on Lake Erie, in an equally forcible way, and was ably abetted by Messrs. Kauffman, Hallberg and Forbes.

Messrs. Hynson and Meissner were supported in their plea to refer the whole matter to the Council, for action later on when the situation should be more fully developed, by Messrs. Eliel and Good.

Mr. Edward Kremers presented the claims of his home city of Madison, Wis., for this honor.

At the close of the discussion, the question was put on an amendment offered by Mr. Searby to the Hynson resolution, that Los Angeles be selected as the place of next meeting, and, upon division, the amendment was lost, by a vote of 23 for to 34 against.

The Chair then put the question upon Mr. Hynson's motion to refer this matter of time and place to the Council, with power to act, and it carried by a practically unanimous vote.

On motion of Mr. Hallberg, as amended and seconded by Mr. Hynson, the Council was requested to fix the time of meeting at some convenient date in July or August of next year.

At the suggestion of Mr. Kraemer, it was distinctly understood that the vote at this time upon the selection of Los Angeles as the next place of meeting was not to be construed as an expression of the Association against that city when the Council should come to consider the matter of a place of meeting, as it was only meant to be an expression of opinion that it was wise, under all circumstances, to leave this matter open for the present.

The General Secretary read telegrams of fraternal greeting and good-will from the California and West Virginia State Associations and from the Denver Pharmaceutical Association, also a message of cordial greetings from ex-president Chas. E. Dohme, dated at Ayr, Scotland, the birthplace of Robert Burns, which had been transmitted through Mr. Sheppard of Boston, Mass.

Committee reports were called for as next in order, and Mr. Hallberg presented the report of the Committee on U. S. Pharmacopoeia as follows :

## REPORT OF COMMITTEE ON U. S. PHARMACOPEIA.

The past year has been one of comparative inactivity on the part of critics of the U. S. Pharmacopœia. The more carefully the work of the Revision Committee has been studied, the more evident it has become that its work was done in a thorough, painstaking manner. In the nature of things it was imperfect, but its imperfections are such as attend every attempt to formulate the results of human discovery and achievement.

Instead of endeavoring to gather up and analyze the critical comments that have appeared during the year, your committee would call attention to some of the debatable questions which the next Revision Committee will have to settle at least temporarily, in the hope that a free discussion of them at this time may be of benefit.

Some of these questions have been raised in a paper recently published, by a member of this committee.

One of the suggestions offered by the writer of this paper was that the official descriptions of drugs of vegetable origin might well include a terse statement of the habitat of the plant yielding the drug, or at least the geographical source of supply. This need not add more than a line, generally to the definition of the drug. *Arnica* thus would be described as the dried flower heads of "a small plant indigenous in Central Europe." *Balsam tolu*, "a balsam obtained by incising the trunk of *Toluifera balsanum* Linné (Fam. Leguminosæ), a tree indigenous to the northern countries of South America," etc.

Some will object that this is not properly a part of the definition or description of a drug, that only in exceptional cases it is important and that the geographical source of a drug in these days may change completely in a decade, as in the case of *cinchona bark*.

Another question that may be raised in this connection is whether it is necessary to give the name of the family to which each plant belongs. This is irrelevant information, and besides botanists do not by any means all agree on questions of classification.

Were the revisers of the Pharmacopœia justified in including under one title the several commercial varieties of aloes? Even if their reasons for doing this were good and sufficient, are not the characteristics of the several leading varieties so marked that they require separate descriptions. The prescriber ought surely to have the privilege of designating the variety he prefers, so that distinctive names as well as separate descriptions are required.

Why should distinct titles be given to the different cinnamons, while in the cases of *Ipecacuanha*, *Pilocarpus*, *Serpentaria* and some others, two or more species are covered by one title?

Are not the differences between *Veratrum album* and *Veratrum viride* too great, chemically and therapeutically, to justify including both under the title *Veratrum*?

Is the expression "and other closely related species" in the definition of *Apocynum* sufficiently explicit? It was adopted in view of the fact that botanists have recently made several species of the forms hitherto included under *Apocynum cannabinum*. It was not intended to extend the definition any further than this, yet the language might be interpreted as authorizing the substitution of another well defined species such as *A. androsæmifolium* for the *A. cannabinum*.

*Cascara sagrada* stands in the British and some other Pharmacopœias as the official title of the drug familiarly so known. Why retain in our Pharmacopœia the unwieldy "*Rhamnus Purshiana*" which no one ever thinks of writing even in a Latin prescription? The vernacular names of many vegetable drugs are used thus in our Pharmacopœia, e. g., *Asafoetida* (formerly two words like *cascara sagrada*, and so written), *Cambogia*, *Calumba*, *Ergota*, *Gambir*, *Guarana*, *Kino*, *Matico*, *Nux Vomica*, *Opium*, *Senna*, *Sarsaparilla*, *Styrax*, *Sumbul*, etc.

Objection has been made to the introduction into the Pharmacopoeia of a drug without giving a formula for any preparation thereof which may be prescribed. The objection does not seem to the present writer to be well taken. If the drug is one which has come to be largely used, for example, as a constituent of cough mixtures, although seldom prescribed by itself, it seems quite reasonable that it should have recognition as an article of the approved materia medica, although quite unnecessary that a formula for a cough mixture containing it should be made official. In such a case, however, there might be recognized a fluidextract for use in extemporaneous prescriptions.

The list of official fluidextracts, as it is, is needlessly extended. There is merit in the plan of the French Codex of merely giving a list of tinctures and similar preparations to be made after a stated method and with a certain menstruum.

Should the Pharmacopoeia state the "average" percentage of alcohol in each preparation containing that fluid? It is urged that such a statement would relieve the pharmacist of the burden of determining the alcoholic content of each product that is to enter into interstate commerce.

Much criticism has been directed against the alkaloidal assay processes of the Pharmacopoeia. Some of these are just. Many of them arise from the distrust with which the experienced analyst approaches a routine different from that to which he has been accustomed. It ought to be more generally known that the sub-committee which decided upon the present assay processes devoted much time to the practical study of the various assay processes recommended by experts, adopting those which gave in different hands the most uniform and most nearly correct results. It is unfortunate that the details of their really arduous work were never given to the public. It would be a very great help to any subsequent committee to have the benefit of their experience.

There are in progress in the Drug Laboratory in Washington, practical tests of some of the alkaloidal assay methods, the results being published from time to time in the proceedings of the Association of Official Agricultural Chemists. The trouble with these tests is that only a certain fixed procedure is to be followed, and there is no encouragement to a discussion of the advantage of deviating from this routine in this way or that. If a group of ten practical drug-analysts could arrange among themselves a comprehensive series of experiments, studying carefully the result of such variations as might seem likely to be advantageous, and give to the public all the results of their work, with their personal preferences, the next Revision Committee would be in a position to make the assay processes of the next Pharmacopoeia as nearly satisfactory as present analytical knowledge and skill will permit. There is opportunity here for enterprise on the part of some of our ambitious pharmaceutical journals.

Should the title *Cerii Oxalas*, with its English equivalent be allowed to stand for an article known to be a "mixture of oxalates of cerium, didymium and lanthanum, and of other rare earths of this group?" To the writer it seems unnecessary to be more explicit in this title than in cases like those of Alcohol, Aether, Lappa, Stramonium, where brevity is considered rather than completeness of definition. Exception may well be taken, however, to the last clause of the foregoing statement, as at once ambiguous and inexact. Is the last "of" to be construed in connection with mixture or with oxalates? If the latter—and such without question is the meaning—the word "metals" should replace "earths?"

Which name, hyoscine or scopolamine is to be retained as the official designation of the "identical" alkaloid having now a choice of aliases. The question presupposes that the Pharmacopoeia is right in affirming that scopolamine is nothing but an alternative name of hyoscine. Is it? First of all let chemists and clinicians settle that point.

In the official processes for making extracts, no attempt is made to save the alcohol. Should not recovery of alcohol by distillation—in vacuum if necessary—be made a part of the process? If an individual choose the wasteful method of simple evaporation, when working on a small scale, that is his own affair.

Why was extract of scopolia made official? If it is for the benefit of manufacturers of belladonna plasters, is it not in order to authorize the substitution of extract of scopolia (also of belladonna root) for extract of belladonna leaves in making belladonna plaster? Is not the extract of the root in any case more suitable for this use?

These are perhaps conundrums enough for one seance. They are only a few of those that the next Revision Committee will have to wrestle with.

The following suggestions for changes in the United States Pharmacopoeia have been submitted to our committee by Dr. Seidell of the Hygienic Laboratory, Public Health and Marine-Hospital Service, Washington, D. C., and are deserving of careful consideration.

*General.* a. The atomic weights should be changed to the basis of  $O=16$ .

b. A statement should be placed in the "Introductory Notices" to the effect that the term "parts" as used in the U. S. P. refers in all cases to parts by weight.

c. The Appendix should contain in addition to the matter at present given, detailed directions for the determination of ash, volatile matter, melting point, boiling point, specific gravity, moisture, etc.

d. The title of the table on pp. 635-6 would be more explicit if it read: Table of Weight and Volume Relations of Liquids of Different Specific Gravities.

*Ammonium Valerate.*—The description of this compound as it now stands does not show its atomic composition, or give any purity requirement. According to the tests given, a product simply responding to qualitative reactions for ammonium and valeric acid, and not contaminated with heavy metals, inorganic constituents or acetate, would be accepted as of satisfactory quality. If it is not thought desirable to require the neutral ammonium valerate, some other compound of ammonium and valeric acid should be designated. A sample of E. & A. ammonium valerate, consisting of colorless, hygroscopic crystals was analyzed in this laboratory and found to be composed of approximately one molecule of neutral ammonium valerate to two molecules of valeric acid.

*Quinine Bisulphate.*—The directions for the ammonia test at foot of page 374 might mislead a person not familiar with this test, since at first sight there is some uncertainty as to whether the 2 Gms. of sample refers to dried material or whether the weighed 2 Gms. is to be dried at  $50^{\circ}$  and then dissolved in water.

*Balsam of Peru.*—In the paragraph on solubilities, the statement "soluble in five parts of alcohol with not more than a slight opalescence" occurs. It is uncertain whether weight or volume parts of U. S. P. alcohol is intended. Also, 11th line from bottom of page, "on mixing the balsam with half its volume of calcium hydroxide," an inexperienced analyst might be uncertain in regard to what form of calcium hydroxide is to be measured by its volume. The experience in this laboratory indicates that the test for limit of acid resins might not be executed satisfactorily upon a sample of Peru balsam which fulfilled practically all the other U. S. P. tests.

*Solubilities.*—The solubilities of the following U. S. P. compounds have been re-determined in this laboratory with great care, and it is suggested that the new data which differ from the old be introduced into the next edition of the U. S. Pharmacopoeia. In the table following, the figures stand for the weight in grams of the amount of solvent required to dissolve to a saturated solution at  $25^{\circ}C.$ , one gram of the compound.



TABLE OF SOLUBILITIES.

	U. S. P. Statements.		New Determinations.	
	Water.	U. S. P. Alcohol.	Water.	U. S. P. Alcohol.
Acetanilide .....	179	2.5	184	2.63
Acetphenetidin .....	925	12.	1305	12.0
Acid benzoic .....	281	1.8	271.4	1.76
Acid boric .....	18	15.3	17.45	13.3
Acid camphoric .....	125	readily	131.6	0.957
Acid citric .....	0.54	1.55	0.49	1.004*
Acid salicylic .....	308	2.0	453.5	2.13
Acid tartaric .....	0.71	1.67	1.36	2.41
Ammonium iodide .....	0.6	9.0	0.55	2.86
Ammonium salicylate .....	0.9	2.3	0.969	2.333
Phenyl salicylate .....	2333.	5.0	—	4.65

## COMMENTS ON THE FOREGOING.

a. It is to be hoped that the next Committee of Revision will state atomic and molecular weights on the basis of  $O=16$ . Not only are the international atomic weights now stated on this basis, but this method gives a much larger proportion of integral values, or a closer approximation thereto than the alternative of  $H=1$ .

b. Should the term "part" invariably have reference to weight? Personally I think so, but the Pharmacopœia recognizes the fact that American pharmacists habitually measure liquids instead of weighing them. The attempt in a former edition of the U. S. Pharmacopœia to eliminate measurement of liquids met with such universal reprobation that the succeeding edition restored volume parts for liquids. Why not adopt the expression volume parts, and then make the statement that the term "parts" unqualified means always parts by weight, while the term "volume parts" means the volume of an equal weight of water under standard conditions? That would permit us to state solubilities in a way that would be at once natural and free from ambiguity. Critics of the Pharmacopœia assume that the statement of solubility given in the book are simply identification tests. It is in fact only in rare cases that they are of any importance for this purpose. On the other hand, they give to the physician who prescribes and to the pharmacist who compounds, valuable practical information. In this view, it is much more natural that volume parts, should be in mind rather than weight parts, and scientific exactness in figures is of secondary consequence. I suspect that in the pharmacopœial statements of solubility more or less closely approximate, rather than rigidly exact figures are the rule, and that in some cases the "parts" given should be really volume parts. Any such looseness, if it exists, should by all means be corrected now that the Pharmacopœia has become legal authority.

In this connection I may express my disapproval of the recommendation to introduce into the Pharmacopœia solubility constants carried to two or three decimal places like some of those in the table above. It surely is sufficiently accurate to say that camphoric acid dissolves in about one part of alcohol instead of 0.957 parts. Citric acid also requires to dissolve it "about one part" (by weight) of official alcohol. It may exist in

\* Citric acid is a hydrated compound but in strong alcoholic solution it loses its water of crystallization and the solid phase in contact with the solution is the anhydrous material, hence it is not correct to speak of the solubility of hydrated citric acid in U. S. P. alcohol. This same criticism will no doubt apply to many other U. S. P. hydrated compounds for which solubility results in strong alcohol are given.

solutions as an anhydrous compound, or in the form of ions; that is not important. The physical fact is that the solid is brought into the condition of a liquid by contact with a trifle more than an equal weight of alcohol—undergoing no significant chemical changes.

Ammonium valerate is one of a number of substances that have definite therapeutic values, but, as met with in the market are of somewhat variable composition, it is surely better to admit such an article with a full definite description, without demanding that it conform exactly to any particular molecular formula, than to require a definiteness of composition not realizable in practice.

The criticism on the ammonia test for quinine bisulphate goes only half way. It should be pointed out that the same criticism applies equally to the test for quinine hydrobromide and quinine hydrochloride, and almost equally to quinine itself. However it is not this point in the test that calls for criticism so much as it is the quantity of these several compounds that is taken in the test. As I have already pointed out repeatedly, the test bears unequally on the different quinine compounds in that it takes no account of the fact that they represent very different proportions of the alkaloid, quinine. The quantity taken in each case should contain at least approximately the same quantity of quinine as in the test as applied to quinine sulphate, and the routine drying at 50°C. for two hours is a gratuitous sacrifice of time and labor except in the case of the sulphate.

Respectfully submitted,

A. B. LYONS,

*Chairman of Committee on U. S. Pharmacopoeia.*

#### SUPPLEMENTARY REPORT.

HOT SPRINGS, ARK., Sept. 9, 1908.

The Committee on U. S. Pharmacopoeia reports that a meeting of the Committee was held this day, the following members being present:

Kebler, Hallberg, Eberle, Caspari, Mittelbach, Havenhill and Beringer.

An organization of the committee for the ensuing year was effected, G. M. Beringer being elected chairman and C. S. N. Hallberg, secretary.

The committee has been divided into the following sub-committees.

*Alkaloidal Assay Processes:* L. F. Kebler, C. E. Caspari, G. M. Beringer.

*Assay Processes for Volatile Oils and Allied Substances:* E. L. Patch, L. D. Havenhill, A. B. Lyons.

*Tests for Organic and Inorganic Chemicals:* L. D. Havenhill, C. E. Caspari, L. F. Kebler.

*Nomenclature of U. S. Pharmacopoeia:* C. S. N. Hallberg, Wm. Mittelbach, E. G. Eberle.

*Organic Drugs—Definitions, Descriptions and Tests:* G. M. Beringer, R. Hunt, E. G. Eberle.

*Alcoholic Content of the U. S. P. Preparations:* C. E. Caspari, L. F. Kebler, E. L. Patch.

*Additions and Eliminations to be recommended in the U. S. P.:* C. S. N. Hallberg, Wm. Mittelbach, G. M. Beringer.

*Reviews of Foreign Pharmacopoeias:* R. Hunt.

*Physical Constants and Standards:* A. B. Lyons, L. F. Kebler.

*Liquid Extractives—Fluidextracts and Tinctures:* L. D. Havenhill.

*Solutions and Liquid Mixtures—Waters, Liquors, Syrups, Elixirs, Glycerites, Emulsions, Mixtures, Liniments, etc.:* E. G. Eberle.

*Solids for Internal Use—Powders, Triturates, Confections, Extracts, Pills, etc.:* C. S. N. Hallberg.

*Solids for External Use—Cerates, Ointments, Plasters, Oleates, Suppositories, Calaplasms, etc.:* Wm. Mittelbach.

It is the intent to have each sub-committee submit a quarterly report to the chairman, and the committee expects to make a detailed report of results and recommendations to the Association at the next annual meeting.

To cover the expense of such printing, posting and materials as may be necessary to carry on this work so assigned, the committee requests that an appropriation not exceeding \$100.00 be made.

The following resolutions have been unanimously adopted by the committee and are submitted to the Association for action:

**WHEREAS**, The National Food and Drugs Act makes the United States Pharmacopoeia and the National Formulary the legal standards for drugs and medicines, the titles for the articles contained in these books and also the nomenclature employed are thus legalized and should, therefore, be consistently adhered to; and

*Whereas*, The chemical nomenclature adopted by the A. A. A. S. has been accepted by several national associations although it is not in harmony with the legalized official titles and appears in much of the literature emanating from these societies and their members and thus causes much confusion; therefore, be it

*Resolved*, That the American Pharmaceutical Association announces its continued adherence to the legalized titles and nomenclature, and directs that these only be used in all of its publications.

*Resolved*, That a Committee on Nomenclature, consisting of three members, be appointed to present this question to the American Chemical Society and to the American Medical Association, and that we solicit the co-operation of these associations in securing a uniformity of titles and nomenclature and a universal adherence to the legal official standards.

Respectfully submitted,

C. S. N. HALLBERG,  
E. G. EBERLE,  
CHARLES E. CASPARI,  
WM. MITTELBACH,  
L. D. HAVENHILL,  
L. F. KEBLER,  
GEORGE M. BERINGER.

President Searby resumed the chair during the reading of this report.

On motion of Mr. England, seconded by Mr. Osseward, of Seattle, the reports just presented were adopted as read.

Mr. Caswell A. Mayo, Chairman of the delegation from this Association to the National Wholesale Druggists' Association, to the meeting in Denver, made the following report:

#### REPORT OF THE DELEGATES TO THE NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

*To the Members of the American Pharmaceutical Association:*

The delegation sent by the American Pharmaceutical Association to attend the Denver meeting of the National Wholesale Druggists' Association was received most cordially by the officers of that association and its members were extended the privileges of the floor and entertained most royally. In conveying the greetings from the American Pharmaceutical Association to the Wholesale Druggists' Association the chairman took occasion to bring before the wholesale druggists the resolutions which had been adopted by the American Pharmaceutical Association at the New York City meeting in September of the same year opposing the establishment of a parcels post in the United

States. The wholesale druggists were assured that the retail trade was very much in earnest in its opposition to the parcels post scheme and felt that the wholesalers should co-operate in opposing the plan. The resolutions were made the subject of vigorous debate, the proposal that the N. W. D. A. commit itself to an active opposition being warmly advocated by the Western and Middle Western members. At the request of the chairman of the Committee on Legislation the matter was referred to that committee without instructions, leaving the committee to act in the premises as it deemed best for the interests of the wholesale drug trade, with the understanding that the subject would be discussed at the next annual meeting.

Respectfully submitted,

CASWELL A. MAYO, *Chairman.*

Mr. Mayo also read the report of the Committee on Publicity, as follows :

#### REPORT OF COMMITTEE ON PUBLICITY.

*To the Members of the American Pharmaceutical Association :*

The particular province of this committee as outlined in the resolutions under which it was appointed is to take every opportunity which presents itself to refute unjust charges which may be brought against pharmacists as a body and to do what can be done through the public press towards building up a better appreciation of the services rendered by pharmacists as a whole to the community. It was pointed out that where any newspaper writer made an unfounded fling at pharmacy, individual pharmacists were deterred from replying through the newspapers for the reason that the undiscerning public is prone to believe that the individual who replied to such general charges is the offending person. The world always believes that "the galled jade winces."

It was proposed that the chairman of the committee should appoint members in all the large centers of population and that each member of the committee should act whenever occasion arose in his own particular territory. The plan was carried out during the past year to the extent, at least, of appointing some twenty members and sending each of them instructions as to the method of procedure to be followed should occasion arise. Effort was made to select men who were active in pharmaceutical affairs and who would be apt to take up the cudgels on behalf of pharmacists, should it become necessary to do so. Each of the members appointed was requested to communicate with the chairman whenever any matters were published which affected pharmacy, but this portion of the duties of the appointees was not fulfilled. The committee should also take an aggressive stand in securing the publication of articles in the lay press setting the pharmacist before the community in a favorable light, and several articles of this kind have been inserted in the public press through the instrumentality of the members.

Your committee recommends that the Reporter to the Public Press be made chairman of this committee, thus slightly widening the scope of his duty. This recommendation could be readily acted on by the incoming president, should he approve of it, and his successor would no doubt be glad to follow his example.

Respectfully submitted,

CASWELL A. MAYO, *Chairman.*

Mr. Hallberg moved the adoption of the reports just submitted, and the Secretary seconded the motion, with the understanding that they be referred to the Committee on Publication, whereupon the Chair put the vote on the motion to accept and refer, and it carried.

Mr. Hynson, of the Committee on Reorganization, submitted an order designed to suspend the By-Laws for one year, including the time of meeting next year, in order to try out a plan suggested by the committee.

This order, he said, would lie over, and be acted on to-morrow morning, if the Association had time to consider it.

The Chair called for the report of the Committee on Procter Monument Fund, and Secretary Kraemer, of that committee, presented the following report, in the absence of Chairman Hancock.

REPORT OF THE COMMITTEE ON THE WM. PROCTER, JR.,  
MONUMENT FUND.

BALTIMORE, *Sept. 5, 1908.*

As Chairman of the Committee on the William Procter, Jr., Monument Fund, after consultation with the other members of the committee, it was determined not to make any active canvass to secure subscriptions this year, because of the adverse financial condition in the country and the disturbed condition of the drug trade generally.

There are some unpaid subscriptions and some moneys for the fund in the hands of various Treasurers of the State Pharmaceutical Associations that have not yet been turned in to your committee.

The present inactivity of the committee is not because of lack of interest, but because we deemed it a matter of prudence. Some progress has been made, so without going into detail, the Chairman will simply report progress.

The attention of your committee having been called to an omission inadvertently made in its report submitted at the last annual meeting, it desires now to state that the names of the contributors to the fund collected by Mr. Hallberg, see p. 98 of the 1907 Proceedings, were published on page 63 of the 1906 Proceedings in connection with the report of that year.

With the return of better financial conditions, your committee proposes to renew its diligent efforts to secure, in the near future, the sum necessary to erect the monument in honor of the memory of the beloved Procter and to the credit of American Pharmacy.

Respectfully submitted,

J. F. HANCOCK, *Chairman.*

On motion of Mr. Lemberger, the report was ordered received and filed.

On motion of Mr. Asher, the Association then adjourned.

---

TWELFTH (AND LAST) SESSION—SATURDAY MORNING, SEPTEMBER 12, 1908.

On this, the last day of the meeting, the Association was not called to order until 11 o'clock, and President Searby apologized for the lateness of the hour, explaining that it was due to a long and very important business session of the new Council, which had just been completed.

As the first in order of business, the Secretary read the minutes of the second general session, held on Tuesday morning, which, on motion of Mr. Whelpley, were approved as read.

The Secretary then read the minutes of the adjourned session of the second general session, held Friday night, and these, after a slight correction, were also approved, on motion of Mr. Bond, of Arkansas.

The Chair called for the reading of the minutes of the new Council, at its session held this morning, and Mr. Joseph W. England, the new Secretary of that body, chosen to succeed Mr. Whelpley, elected Treasurer at this meeting, read the minutes as follows :

## FIRST SESSION OF THE NEW COUNCIL—SEPTEMBER 12, 1908.

The members of the new Council met for organization at the Hotel Eastman at 9:30 a. m. Present Messrs. Beal, Bond, Caspari, Eberie, Eliel, England, Godbold, Hynson, Lemberger, Mason, Meissner, Mittlebach, Remington, Searby, Seltzer, Hallberg, Oldberg, and Whelpley.

The following officers were elected for the current year: Chairman, J. P. Remington; Vice-Chairman, Wm. M. Searby; Secretary, J. W. England.

On motion of Chas. Caspari, Jr., seconded by W. M. Searby, the bill of the chairman of the Committee on National Formulary, for expenses of the meeting of said committee, as authorized by the Council in Motion No. 35 of August 21, 1908 and amounting to \$912.15 was ordered to be paid.

The following resolutions were offered by J. H. Beal and seconded by H. M. Whelpley:

WHEREAS any action looking toward any change in the relations of this Association to the N. A. R. D. is one which is deserving of long and careful study in order that such action may be wise and judicious and redound to the prosperity and progress of both associations, and

Whereas an impression has been created that the special Committee on Relations to the N. A. R. D. was intended to act quickly in such matter, therefore, be it resolved:

That the said committee is hereby instructed to study carefully the problems committed to its care and to report its conclusions and recommendations to this Council.

The resolutions were adopted.

On motion of C. S. N. Hallberg, seconded by H. P. Hynson, it was agreed that the by-law governing the meeting of the Section on Commercial Interests be suspended for the year 1909.

On motion of J. P. Remington, seconded by O. Oldberg, the following resolution was adopted:

Resolved that the Council of the American Pharmaceutical Association request the Surgeon General of the U. S. Public Health and Marine Hospital Service to include in the Digest of Comments on the U. S. Pharmacopoeia, now under way, a report of Comments on the National Formulary, and that the General Secretary be requested to send Surgeon General Wyman a copy of this resolution.

On motion the Council then adjourned.

J. W. ENGLAND, *Secretary*.

The Chair stated that, without objection, the minutes of the Council would stand approved as read, and it was so ordered.

The Chair called on the General Secretary to read some resolutions that had come in from the different sections, with request for action by the Association in general session.

The Secretary said there were five such resolutions from the Section on Education and Legislation, and he proceeded to present them separately. The first was a resolution endorsing the object and principles of the Committee of One Hundred of the American Health League, and was as follows:

WHEREAS, The members of the American Pharmaceutical Association have repeatedly and consistently expressed themselves as being in favor of a National Department of Health; and,

Whereas, The Committee of One Hundred of the American Association for the Ad-

vancement of Science, the American Health League, and the several co-relating bodies, are actively engaged in a propaganda for the promotion of interest in matters relating to the public health; now, therefore, be it

*Resolved*, That we as members of the American Pharmaceutical Association request this Association in general meeting to endorse the object and the principles of the Committee of One Hundred and of the American Health League, and offer to co-operate with them, and with other organizations, to promote the development of existing agencies devoted to the safeguarding of the public health, and to advocate the ultimate development of a National Bureau or Department of Health.

On motion of Mr. Meissner, seconded by Mr. Good, the resolution just read was adopted.

The Secretary next read the following resolution on the temperance question, and the attitude that druggists should assume toward it :

WHEREAS, A great tidal wave of temperance legislation and reform is sweeping over our own and several foreign lands, and nearly half the entire population of the United States, occupying two-thirds of the geographical area of the country, has already outlawed the saloons in no uncertain manner; and,

WHEREAS, A small minority of druggists are taking illegal and dishonorable advantage of the situation to do a general business in the sale of liquor, while non-druggists, seizing upon the opportunity, are employing registered men, opening nominal drug stores, and really conducting saloons under the protecting cloak of pharmacy; and,

WHEREAS, This condition of things presents pharmacy with a grave and threatening danger, is already bringing odium and calumny upon the whole profession, and calls for prompt and vigorous measures if we are to save the honor and integrity of the calling; therefore be it

*Resolved*, By the members of the American Pharmaceutical Association, that we discountenance the sale of liquor in drug stores for other than legitimate medicinal purposes; that any pharmacist or pseudo-pharmacist who strives to take advantage of temperance legislation for personal profit is a disgrace to the profession, and should be ostracized by it; and that as members of an upright and conscientious calling, we should ourselves strive to undertake the discovery and punishment of those within our ranks who bring us all into dishonor; be it further

*Resolved*, That we call upon the city, county and state pharmaceutical associations throughout the "dry" sections of the country to co-operate with the local authorities, prove the intention of the drug trade to respect the law, show its determination to tolerate no liquor evils, and assist in exposing and penalizing those druggists who abuse their privileges, and who thus drag the name of Pharmacy into the mire of infamy and degradation.

The resolution was greeted with applause, and the Chair stated that it had been passed with unanimity and vigor by the Section on Education and Legislation. On motion of Mr. Bond, of Arkansas, seconded by Mr. Payne, of Georgia, the resolution was unanimously adopted.

The Secretary read the third resolution coming from the Section on Education and Legislation :

WHEREAS, The importation of Coca and its alkaloids and derivatives can be controlled only through Customs Service;

*Resolved*, That in the opinion of the American Pharmaceutical Association every im-

portation of Coca, its alkaloids and derivatives should be registered at the port of entry and also that the Department of the Treasury, or some other department of the Federal Government should keep an accurate record of the sale and disposition of the substances and make regular report thereof.

*Resolved*, That we respectfully request the U. S. Government that this be done.

On motion, the resolution was adopted.

The Secretary read the fourth resolution :

*Resolved*, That the American Pharmaceutical Association in convention assembled, at its fifty-sixth annual meeting, requests the manufacturers and jobbers of drugs and medicines, the publishers of price lists and the boards of pharmacy to adopt the pharmacopoeial nomenclature for all official drugs and chemicals.

*Resolved*, That we urge them to discourage the use of such meaningless or incorrect titles as oil of vitriol, muriatic acid, iodide of potash, carbolic acid, coal-tar creosote, green opium, etc.

The Chair put the vote on adoption of the resolution, and it carried.

The Secretary said the Section on Education and Legislation had also referred to the Association in general session the letter he held in his hand from Dr. F. E. Stewart, of Philadelphia, with request that a special committee on patents and trademarks, to consist of five members, be appointed. This letter communicated the fact that Dr. Herbert A. Burrell, of Boston, President of the American Medical Association, had appointed such a committee, and the writer suggested that a similar committee be appointed by this Association, to confer with the committee of the A. M. A.

The Chair put the vote on the proposition to appoint a committee of five in this behalf, and it carried. The Chair stated that the President-elect would appoint the committee.

The Secretary then read the following communication from the Section on Commercial Interests :

#### RESOLUTION ON ADVERTISEMENTS OF FRAUDULENT MEDICINES.

The American Pharmaceutical Association, founded in 1852, in Convention assembled, representing the best sentiments of professional, scientific, educational and commercial pharmacy, would respectfully submit to the editors and managers of the secular press that the respect of the more intelligent classes of society, for the press, is being certainly and most unfortunately lowered, and that its beneficent influence thereby greatly lessened because of the publication of medicinal recipes couched in false and misleading language, and printed in misleading form, which are placed in locations calculated to help in the deception of exploiting proprietary nostrums as regular non-protected medicines.

Matter of this kind received and paid for as advertisement is allowed to appear as editorial advice upon medical treatment, the editors and managers appearing to assume responsibility therefor, thus betraying the confidence of the readers in the integrity of the press.

It is also respectfully submitted that these advertisements are purposely written in a style intended to create false impressions, and are paid for to produce the belief that such recipes are not advertisements. It is submitted as unquestioned fact that these recipes do abundantly mislead and betray your confiding readers.



The American Pharmaceutical Association with fifty-six years of devoted and unselfish service to the cause of humanity earnestly appeals to American Journalism to carefully consider this matter, and in behalf of mankind, begs it to take such effective steps as will prevent the further practice of what is believed to be opposed to the best interest of society and the integrity of the press.

Mr. Hynson moved the adoption of the resolution by this Association, and its reference to the editor of the *Bulletin* and to the Secretary, with request that as much publicity be given the matter as possible; also that copies of the resolution be furnished the pharmaceutical and secular press, that all might understand the position of the American Pharmaceutical Association on this subject. He cheerfully accepted a suggestion from Mr. Hallberg, that the Committee on Publicity be especially requested to give this action of the Association the widest circulation possible.

The motion was so put and carried.

Mr. Bond asked that the Little Rock papers be not overlooked in the furnishing of copies of this resolution. Mr. Good made the same suggestion as to the Hot Springs papers, and the Chair said these papers would be duly supplied with this information—"and *hot*, too!" However, he did not want the impression to go abroad that the Little Rock and Hot Springs papers were less ethical than "the other brethren of the press." He said he hoped that one result of this meeting in Arkansas would be the "purification of the Arkansas press."

The Secretary also read the following resolution from the Section on Scientific Papers, and on motion of Mr. Mayo, duly seconded, the same was adopted:

WHEREAS: It appears, from a paper entitled *Crude and Powdered Drugs at the Port of New York during the year 1907-1908*, and submitted by Dr. H. H. Rusby to the Scientific Section, that there is a lack of uniformity in the administration of the laws governing the admission of drugs at the different ports of the United States; therefore be it

*Resolved*, by the American Pharmaceutical Association that this condition is one which is most objectionable and demoralizing and that the Association hereby respectfully urge the Secretary of Agriculture and the Secretary of the Treasury to take such steps as may be necessary to secure absolute uniformity in the administration of the laws governing the admission of drugs at the several ports of the United States, and be it further

*Resolved*, that the General Secretary of the American Pharmaceutical Association be instructed to transmit copies of these resolutions, together with copies of Dr. Rusby's paper to the Secretary of Agriculture and to the Secretary of the Treasury.

Mr. Remington offered resolutions of thanks for the hospitality extended the Association:

Mr. Payne moved to amend by adding to the resolution that the Association tenders its hearty thanks to the Arkansas Association of Pharmacists, led by its worthy President, Mr. Francis G. Schachleiter, and to Miss Mary A. Fein, of Little Rock, Secretary of the Arkansas Association; for

the generous manner in which they have given their assistance to the members of this Association during the meeting.

Mr. Remington accepted the amendment with pleasure, and the Chair put the vote on the resolutions as amended, and they were adopted by a unanimous rising vote.

WHEREAS, The Fifty-sixth Annual Meeting of the American Pharmaceutical Association held at Hot Springs, Ark., is about to adjourn; and

Whereas, The hospitality of our friends from Arkansas has been warm, hearty and sincere; therefore, be it

*Resolved*, That we tender to our local Secretary, Martin A. Eisele, of Hot Springs, Ark., especial thanks for his successful efforts in providing for our entertainment.

*Resolved*, That we tender the Committee of Arrangements, collectively and individually, our sincere thanks for many kindly acts of hospitality which have made this meeting a memorable one in our history.

*Resolved*, That we hereby tender our grateful acknowledgement to the Arkansas Pharmaceutical Association, led by its worthy president, Mr. Frank Schachleiter, and to the pharmacists of Hot Springs, as well as their ladies and committees, for their united courtesies.

*Resolved*, That we hereby express to Miss Mary A. Fein, of Little Rock, Ark., secretary of the Arkansas Pharmaceutical Association, our cordial appreciation of the generous manner in which she has gratuitously given efficient assistance to the members of this Association throughout the meeting.

The Secretary stated that this brought the work of the session up to the consideration of committee reports, and that the first report would be that from the Committee on Weights and Measures.

Mr. Hyn-on, seconded by Mr. Forbes, moved to refer the report to the Committee on Publication, but the Secretary suggested that it would be well at least to read the three recommendations made by the committee, and he did so accordingly. The complete report here follows:

#### REPORT OF THE COMMITTEE ON WEIGHTS AND MEASURES.

*To the President and Members of the American Pharmaceutical Association:*

Your Committee on Weights and Measures begs to report its work during the past year on this important matter.

The committee appointed was a unit in favor of the metric system and wishes to express its support in this direction to the U. S. P. committee.

While we appreciate the enormity of the task of making the metric system the official system of weights and measures in this country we have done our mite in that direction.

It is surprising to note the great numbers of pharmacists who are indifferent and even opposed to the metric system, but we must observe that the large majority of those who are in that frame of mind are not members of the A. Ph. A. nor of a state association, and perhaps not even interested in local affairs and are willing to trundle along in the narrow path they have prepared for themselves.

Upon inquiry information was gained that a large number of those who are so narrow in their ideas, are not subscribers to even one drug journal. To reach these people is the problem.

As to the remaining pharmacists who are opposed to the metric system we find that

their disposition is due to the lack of application of that system in prescription writing, which has made them careless in that direction and perhaps have forgotten all they have ever read about it.

A letter written to the president of the American Meteorological Society brought forth some very interesting information, and of course a similar atmosphere surrounded the letter I received in response, viz., indifference on the part of those classes of merchants most deeply interested in weights and measures.

Responses from some prominent Congressmen indicate their willingness to act in favor of a bill making the metric system of weights and measures the official system in the United States and possessions if such a bill were introduced and enough interest shown on the part of the commercial branches as to warrant them to devote their time and energy to it. They feel that sooner or later the climax must be reached and will be adopted, but some impetus must be effected by the commercial world.

We beg to state that a great drawback, which in our estimation is one of the most potent factors in checking the intentions of the U. S. P., is that the N. F. recognizes both the metric and the apothecaries' systems, which in our minds is contrary to the step intended by our standard, the U. S. P.

We therefore recommend:

1. That a Committee on Weights and Measures be appointed and that this committee continue on these lines of interesting the members of Congress.

2. That the A. Ph. A. issue a small pamphlet explaining the metric system and its advantages and distribute these pamphlets among the students of the medical college, (for the students are the people we must reach) thereby giving the young physician the guide to his calculations.

3. That the quantities of substances required in the making of the preparations of the N. F. be given in metric system only.

We further endorse the recommendations of the committee of last year.

Respectfully submitted,

HERMAN J. LOHMANN, *Chairman.*

On motion of Mr. Kraemer, the second recommendation, in regard to the issue of a pamphlet explaining the metric system and its advantages, was referred to the Council, as it involved an expenditure of money.

The third recommendation, as to use of the metric system only in the National Formulary, was passed without action, upon the suggestion of Mr. Beringer, that this question had already been decided in passing on the report of the Committee on National Formulary.

This reminded Mr. Hynson that several items in the report of the Committee on National Formulary had been passed for the time being, and he moved that they be referred to the Council, with power to act.

Mr. Beringer moved as a substitute that the fourth recommendation in the committee's report, that the present scope of the Formulary as indicated in the preface be continued, be approved, and this motion was seconded by Mr. Hallberg and others and carried.

The Secretary read the ninth recommendation, that a statement be inserted in the preface, that the National Formulary does not assume any responsibility for the therapeutic value of any preparation, and that the questions of additions or eliminations be decided mainly on the basis of commercial demands, and on motion of Mr. Beringer, seconded by Mr. Payne and Mr. Hallberg, the recommendation was adopted.

The Secretary read the tenth recommendation, that suitable definitions for unofficial ingredients may be adopted, and this recommendation, on motion of Mr. Beringer, seconded by Mr. Payne, was also adopted.

The Secretary presented in abstract the report of the General Committee on Membership and Reception, the following being the full text of the report :

#### REPORT OF GENERAL COMMITTEE ON MEMBERSHIP AND RECEPTION.

In presenting the Report of the Committee, the Chairman regrets exceedingly that the number of new members is not larger. During the last year efforts have been made somewhat along the lines indicated in the last report of our Committee and with some success.

The colleges of pharmacy have made an excellent showing and while it is difficult to arrive at the exact number of nominations made as prizes by the colleges, yet the aggregate must be nearly fifty and indicates a cordial co-operation on the part of the schools in extending the usefulness of our Association.

But few of the State Boards of Pharmacy are offering memberships as prizes. The State Boards of Maryland and Delaware have offered such prizes during the year.

Very few of the State Associations offer memberships as prizes for meritorious papers and this part of the plan has been discouraged somewhat for the reason that it frequently happens that the persons presenting papers are already members of the Association.

The present time seems most opportune for greatly augmenting our membership. There would seem to be a general awakening of activity among pharmaceutical organizations: state associations are thriving, county and city associations are springing up; the spirit of fraternalism and progress is everywhere in evidence. Now is the time for our Association to assert itself and to occupy the commanding position to which its age, prestige and activity entitle it, but to do this we must be more nearly representative of the great body of pharmacists than we are now; we must have at least one pharmacist in every ten marching in our ranks; we must have four thousand members at least if we are to do the most effective work.

Your Committee believes that a much more comprehensive plan for increasing the membership should be adopted than has been possible heretofore. This plan should necessarily include co-operation with the monthly "Bulletin" of the Association and it is suggested that the clerical work should be conducted through the office of the "Bulletin."

It would seem that the local branches which have already shown such great activity in promoting the interests and adding to the membership of our Association should be aided and stimulated in this work in every possible way. A suggestion has been made also that a representative of the Association be secured in each congressional district who shall present the names of suitable candidates for membership in his district and endeavor to bring them into the fold.

Your Committee is pleased to note that the suspensions during the past year have been only half as numerous as during the year preceeding.

A tabulation has been prepared showing the number of members in the various states of the union, also the proportion of members as compared with the number of drug stores. The tabulation follows :

	Members Aug. 1, 1908.	No. of drug stores.	Proportion of drug stores to each member.
Pennsylvania .....	269	3,500	13
Illinois .....	232	3,000	13
New York .....	220	4,100	18
Ohio .....	142	2,200	16
Massachusetts .....	102	1,600	16
Missouri .....	101	2,600	26
Maryland .....	88	700	8
New Jersey .....	76	1,000	13
Indiana .....	75	2,000	27
California .....	64	1,000	16
Arkansas .....	53	1,000	20
Michigan .....	52	1,600	31
District of Columbia .....	48	200	4
Louisiana .....	47	600	13
Kentucky .....	42	1,000	24
Iowa .....	37	1,900	53
Texas .....	37	2,200	60
Minnesota .....	35	900	26
Connecticut .....	34	600	18
Maine .....	28	400	14
Wisconsin .....	25	900	36
Colorado .....	33	500	15
Nebraska .....	25	900	37½
Georgia .....	23	800	35
Florida .....	22	400	18
Kansas .....	22	1,200	54
Washington .....	21	500	26
West Virginia .....	19	350	18
Virginia .....	18	550	30
Mississippi .....	17	600	35
Oklahoma .....	17	1,000	60
Alabama .....	15	600	40
Rhode Island .....	15	280	19
South Dakota .....	15	350	23
North Carolina .....	12	600	50
Tennessee .....	12	600	50
Vermont .....	10	200	20
Oregon .....	9	250	28
New Hampshire .....	8	240	30
North Dakota .....	4	360	90
Utah .....	5	200	40
Idaho .....	3	200	67
Montana .....	3	200	67
Arizona .....	2	100	50
Delaware .....	2	120	60
New Mexico .....	2	100	50
South Carolina .....	1	400	400

According to the tabulations above the states possessing the largest number of members in proportion to the number of stores rank as follows:

- |                          |                    |
|--------------------------|--------------------|
| 1. District of Columbia. | 10. Massachusetts. |
| 2. Maryland.             | 11. California.    |
| 3. Pennsylvania.         | 12. New York.      |
| 4. Illinois.             | 13. Connecticut.   |
| 5. New Jersey.           | 14. Florida.       |
| 6. Louisiana.            | 15. West Virginia. |
| 7. Maine.                | 16. Rhode Island.  |
| 8. Colorado.             | 17. Arkansas.      |
| 9. Ohio.                 |                    |

It is interesting to note the representation in the various large cities of the country. The cities rank in membership as follows:

1. Chicago .....	168	10. San Francisco .....	33
2. Philadelphia.....	134	11. Boston .....	32
3. New York .....	127	12. Pittsburg .....	28
4. Baltimore .....	74	13. Cincinnati .....	27
5. St. Louis.....	59	14. Hot Springs.....	26
6. Washington.....	47	15. Indianapolis.....	25
7. Cleveland .....	44	16. Detroit .....	24
8. New Orleans .....	38	17. Louisville .....	20
9. Brooklyn .....	36		

In preparing this tabulation your Committee observed with surprise the number of large cities which are not represented by members of our Association or have not exceeded three members. It would seem as though these cities should offer a particularly fertile field for our labors if a good active worker could be induced to take hold in each

Altoona, Pa.....	none	Paterson, N. J. ....	1
Birmingham, Ala. ....	none	Peoria, Ill. ....	2
Butte, Mont. ....	1	Portland, Ore. ....	2
Charleston, S. C. ....	none	Quincy, Ill.....	2
Colorado Springs .....	3	Rochester, N. Y. ....	none
Dayton, Ohio.....	none	Salt Lake City .....	1
Duluth, Minn. ....	2	San Antonio, Tex. ....	none
Erie, Pa.....	none	Scranton, Pa. ....	3
Kansas City, Kan.....	1	Terre Haute, Ind. ....	2
Knoxville, Tenn. ....	1	Trenton, N. J. ....	1
Manchester, N. H. ....	1	Wichita, Kan. ....	1
Memphis, Tenn. ....	2	Wilmington, Del.....	1
Oakland, Calif.....	1	Youngstown, Ohio .....	1

## STATEMENT OF MEMBERSHIP.

Reported September 1, 1907 .....	2,070
Enrolled during 1907 meeting.....	86
Elected since the 1907 meeting, but included in 1907 Proceedings.....	42

Total ..... 2,198

Less losses as stated in the 1907 Proceedings.

Deaths .....	21
Resignations .....	31
Suspensions.....	59
	111

Net membership as stated in 1907 Proceedings.....	2,087
Elected since publication of Proceedings .....	164

Membership report September 1, 1908 .....	2,151
Total new members elected since the 1907 meeting and up to September 1, 1908 .....	206

## STATEMENT OF EXPENDITURES FOR COMMITTEE ON MEMBERSHIP.

July 1, 1907 to July 1, 1908.

August	22, 1907.	Philadelphia Branch.....	\$25 00
August	22, 1907.	Wm. B. Day Secretary Chicago Branch .....	13 00
August	30, 1907.	Wm. T. Wenzell.....	3 00
October	1, 1907.	Wm. T. Wenzell .....	2 00
November	11, 1907.	Wm. T. Wenzell .....	1 00
January	2, 1908.	E. F. Kelly, Secretary Baltimore Branch .....	3 00
March	28, 1908.	Northwestern Branch .....	4 00
May	1, 1908.	Wm. B. Day, Secretary Chicago Branch.....	14 00
			<hr/>
			\$65 00

For the Committee,

WM. B. DAY, *Chairman*.*Chicago, Ill., September 1, 1908.*

On motion of Mr. Bond, the report was received and referred for publication.

The Chair, referring to the report of the Committee on Membership just read, said he felt like assuming "imperial powers" here, such as no President ever before had assumed, and he made bold to appoint every member present a committee of one on membership.

Mr. Remington made the following report for the delegates from this body to the American Medical Association.

## REPORT OF DELEGATES TO THE SECTION ON PHARMACOLOGY OF THE AMERICAN MEDICAL ASSOCIATION.

*To the American Pharmaceutical Association :*

There can be no question that the last meeting of the Section, held in Chicago, June 2nd to 5th, 1908, was by far the most important and interesting meeting of the Section that has ever been held. There certainly can be no comparison between the earlier meetings of this Section and the one recently held. For a number of years it was difficult to get more than ten or twelve physicians, out of the whole membership, to attend the meetings, while at the last meeting there were at least five times this number of physicians and others in attendance.

A symposium on the Pharmacopœia and the National Formulary occupied one of the sessions. The discussions were interesting and illuminating, full opportunity being given for hearing various plans for improving the methods of revising the United States Pharmacopœia. The Chairman of the Committee of Revision was present and was given the opportunity of answering questions and replying to some of the points made in the discussion. It was evident that the American Medical Association would hereafter take vastly more interest in the Pharmacopœia than it ever has before.

In this connection the work of the Chicago Branch of the American Pharmaceutical Association should be mentioned. About 150 different preparations, prepared by the Chicago members, were on exhibition in the hall and attracted much attention. Too much cannot be said in favor of this method of doing propaganda work. Even well-informed physicians are surprised to find that many preparations which they prescribed can be made by the retail pharmacist, as physicians are educated mainly nowadays to believe that the manufacturer, having a large establishment, is the only one properly equipped to make official and unofficial preparations. It will be a great day for pharmacy when the physician will establish the habit of calling frequently upon the corner apothecary to confer with him upon the most eligible means of preparing medicines for the doctor's own patients.

The relations between pharmacists and physicians were shown to be of a most harmonious and uplifting character and at no meeting, since the Section was first inaugurated, was there a better spirit of coöperation than at the one held in 1908.

Another feature of the work of the American Medical Association has been the work of the Council of Pharmacy and Chemistry, who have steadfastly pursued a course of enlightenment of the medical profession, by exposing fraud in a fearless manner. This, coupled with the work of the Department of Agriculture at Washington, and at the large number of joint meetings of physicians and pharmacists throughout the United States have been producing results far-reaching in importance, and the public to-day are showing an appreciation of the exposures.

The predominating note throughout the meeting of the Association was preventive medicine and sanitary science. Like every new condition, there is grave danger of going too far. Drugless therapy has become a fetich in many sections of our country. The Section on Pharmacology passed resolutions which were intended to sound a warning in this direction and they will be found below:

"APPROVE PHARMACOPEIAL REVISION.

*Whereas*, The value of pure air, pure water, exercise, bathing and other hygienic agents and methods for the treatment of diseases, cannot be too strongly endorsed by the Section on Pharmacology and Therapeutics, but the use of standard pharmaceutical preparations of known and tried efficiency should not be ignored as they constitute important adjuncts in treatment. And,

*Whereas*, The neglect and indifference of many practitioners to the recent great development of more exact methods of standardization as well as those of approving the purity of official medicines has seriously impeded the growth of rational therapeutics and has encouraged the use of proprietary remedies and those of unknown composition. Be it therefore

*Resolved*, That the Section on Pharmacology and Therapeutics earnestly recommends and pledges its support to every well-directed effort which will aim to determine the exact value of therapeutic agents or scientific methods which will be open to all and uncontrolled and uninfluenced by commercial interests which sometimes benefit the individual at the expense of the many who trust the practitioner to restore them to health.

*Resolved*, That this Section tender its active support to the Committee on Revision of the U. S. Pharmacopœia and to the American Pharmaceutical Association in their efforts to improve both legal standards by suggestions and recommendations to the end that both the medical and pharmaceutical professions unite in a pledge of active and continued effort in combating danger, disease and death."

The meeting of the Association was the largest and, in many respects, the most important yet held; nearly 12,000 physicians and others being in attendance and the reception given to the members of the pharmaceutical profession was cordial and gave evidence of future usefulness.

J. P. REMINGTON, *Chairman*.  
M. I. WILBERT,  
OSCAR OLDBERG,  
WILLIAM A. PUCKNER,  
A. M. ROEHRIG,  
HENRY KRAEMER,  
C. S. N. HALLBERG,  
WILLIAM BODEMANN,  
CHARLES CASPARI, JR.,  
WILLIAM B. DAY,  
*Committee.*



The Chair called for action, saying this was a very important and satisfactory report. Mr. Payne, seconded by Mr. Kraemer, moved to receive and refer for publication.

Mr. Hallberg said that, while it was true that, at the Chicago meeting of the American Medical Association, there was a sort of symposium on the subject of infectious diseases, with a member of the Panama Canal Commission as the presiding officer, which fact attracted greater attention to the matter, with that particular feature of the meeting eliminated there was very little said or done on the subject of so-called "drugless therapeutics"—it was very little in evidence there; and he felt that the committee was scarcely warranted in stating that the physicians were getting more and more into the fashion of advocating this idea. Personally, he believed the pendulum was swinging the other way now, and that the tendency was to come back to rational therapeutics, coupled with the idea of better medicines.

The motion to receive and refer the report was then adopted.

Mr. Remington also presented the report of Delegates to the 1907 meeting of the N. A. R. D., in Chicago :

#### REPORT OF THE DELEGATES TO THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

##### *To the American Pharmaceutical Association :*

The Ninth Annual Meeting of the Association of Retail Druggists was held in Chicago, September 16 to 20, 1907. It was very largely attended and by many was regarded as the crucial meeting of this body. Its future was put in jeopardy, to some extent, by what has now come to be largely known as the "Indianapolis decision."

This, it will be remembered, was a suit for injunction by the United States Government against the National Association of Retail Druggists, the National Wholesale Druggists' Association and the Proprietary Association of America. The Government's contention was that the Sherman anti-trust law had been violated and the defendants accepted the best terms that the Government submitted in the case without entering a defense, which would have involved great expense with little chance of winning the suit. The prominent features which were put forward by some of the members to rehabilitate the finances of the Association were a number of schemes for coöperative commercial pursuits; publishing business, etc., and the U. S. Pharmacopeia and the National Formulary propaganda. None of these plans received any encouragement except the propaganda. The latter was energetically pressed forward and much work has been done by the Association the last year.

At the coming meeting of the N. A. R. D. in Atlantic City, the future of the Association will be fully determined. There exists the best feeling between the Association and the American Pharmaceutical Association and it is earnestly hoped that these relations may become closer as time progresses.

J. P. REMINGTON, *Chairman*,  
F. W. MEISSNER,  
WILLIAM C. ANDERSON,  
WILLIAM BODEMANN,  
L. C. HOPP,

*Committee.*

The Chair called for action, and Mr. Eberle moved to receive the report and refer for publication. Carried.

Mr. Francis B. Hays presented his report as Reporter to the Public Press:

#### REPORT OF THE REPORTER TO THE PUBLIC PRESS.

*To the Officers and Members of the American Pharmaceutical Association:*

Your reporter to the public press is glad to be able to present a report less pessimistic in tone than the one he felt called upon to make at the meeting held in his home city last year. While the New York papers either ignored the presence of the Association in that city twelve months ago, or grudgingly gave a half-dozen lines now and then to our proceedings, the three daily papers of Hot Springs have cordially welcomed your reporter to their offices and opened their columns to everything he has offered in regard to our meeting and members. Not only this, but much of the material furnished them they have communicated to out-of-town publications for whom the local newspaper men act as representatives.

With the results of the co-operation of the city papers and your reporter those present are doubtless more or less familiar, and if these results are not just what you would have them, you should attribute that fact to the shortage of outside men on the staffs of the local newspaper offices and the consequent dependence of the one morning and two afternoon journals of this city almost entirely upon the efforts of your reporter for facts concerning who you are and what you are doing, and the inability of your reporter to perform in a thorough manner the additional labor which thus fell to his lot.

In conclusion, your reporter would suggest that in years to come it might be interesting for us to be able to turn to the newspaper accounts of our meetings and see how we have been treated from year to year by the local press of the communities in which we have met. If this suggestion appeals to the Association, possibly our Historical Section might be induced to collect and preserve the papers which give space to our proceedings.

Respectfully submitted,

FRANCIS B. HAYS,

*Reporter to the Public Press.*

*Hot Springs, Ark., September 12, 1908.*

Mr. Kraemer moved to receive the report and refer for publication, and that the Association tender its thanks to Mr. Hays for his painstaking efforts in bringing the work of the Association before the public in the way he has, and also that the press of Hot Springs, Ark., be tendered the thanks of the Association for its ample publication of the proceedings of this meeting.

This motion was seconded by Mr. Roehrig and Mr. Burge, and carried.

Mr. Hynson presented the report of the Committee on Reorganization, coupled with a resolution to suspend the By-laws for one year (read at last night's session), and a proposed order of reference of certain business to the Council, as shown:

#### REPORT OF COMMITTEE ON RE-ORGANIZATION.

*To the Officers and Members of the American Pharmaceutical Association:*

The members of your Committee revert to the report made by their predecessors at the last annual meeting of the Association, and respectfully call attention to the request made, that members of this Association and the local branches proceed to actively discuss this important subject and transmit their opinions and findings to your committee.

We regret to state that we have had little or no help, and without more pronounced expression of the feeling of those interested, your Committee concludes itself unable to make recommendations which we think conform to the views of a majority of our members.

Your Committee believes the matter should be treated in a conservative manner, but admonishes the Association to give to it that attention which its importance seems to deserve, especially, at this meeting.

It is feared that forms of organization are not well established or sufficiently studied by the average member. We, therefore, take the liberty of calling special attention to the fact that a consideration of the organic laws of an organization—the *Constitution* should be entirely separated from the mere matter of "By-laws," or rules of order, which apply only to details, and are not much more in effect than resolutions or motions that have been adopted, while the constitution has to do with the vitals of the Association, its name, objects, aims, the composition, the character of its members, its officers and its reasonable preservation within its original lines of action. The constitution should not, therefore, include less important matters of government which necessarily must be changed from time to time in an active and progressive body.

We respectfully submit that there is a fundamental subject that must be settled by the Association and should be settled by it, before any serious effort is made towards reconstructing its organic laws and rules of order. *This is involved in the questions of whether we shall or shall not return to the delegate form of organization*, as originally contemplated by the founders of this Association, for the better transaction of the actual business of the Association, as well as for the proper representation of all its members. If it is not decided to do this, then we should continue the present form of a general meeting, with its uncertain and ever-changing membership, coupled with the executive body: the board of directors, as represented by the present Council.

In the opinion of the members of the Committee, the delegate body would seem to conserve and promote the best interests of the Association, its members, and, of course, American pharmacy. This opinion is also in accord with the conclusions expressed at an open meeting of this committee, held in the "Board Room," Hotel Eastman, Hot Springs, August the twelfth, of this year. Acting upon the vote taken at this meeting, we submit herewith an order which will, if adopted, suspend the By-laws for one year only, and will give the Council plan a trial for that period, when it may be continued or revoked, as is desired or advisable. We recommend the adoption of the following:

"It is hereby ordered that the transaction and completion of all business as provided for in the By-laws, exclusive of Section work and the election and installation of officers, be referred to the Council, without being subject to revision by the Association.

*"Provided,* That this order shall not go into effect until the end of the next and final session of this meeting and shall become null and void after the adjournment of the next annual meeting.

We also submit a proposition to amend the Constitution at the next annual meeting as follows:

Strike out all the articles now appearing under the sub-heading "Constitution," from Article I to Article V inclusive, and substitute for them Article I of the original Constitution of this Association and six other articles to be known as Articles II, III, IV, V, VI and VII, which shall read as follows:

## CONSTITUTION.

### ARTICLE I. *Name, Aims and Objects.*

This Association shall be called the American Pharmaceutical Association. Its aim shall be to unite the educated and reputable pharmacists and druggists of the United States in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulteration.

2. To establish the relations between druggists, pharmacists, physicians and the people at large, upon just principles, which shall promote the public welfare and tend to mutual strength and advantage.

3. To improve the science and the art of pharmacy by diffusing scientific knowledge among apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of employment so as to prevent as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and as much as possible restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.

#### ARTICLE II. *Composition.*

The "Association" as provided for in the Preamble and as named in Article I, shall be composed of two principal parts, namely: The "General Association," and the "Council." The General Association shall be divided into "Sections" and from the membership of the Council shall be formed a "Board of Trustees."

#### ARTICLE III. *Membership.*

The General Association may include regular, life, and honorary members. The Council may include ex-officio, elected, and delegate members, all of whom must have been members of the Association, in good standing, for three years and shall be known as "Councilors."

#### ARTICLE IV. *Officers.*

The officers of the Association shall be a President, First Vice-President and Second Vice-President, who shall be elected annually by the General Association; a Chief Councilor, General Secretary, Treasurer, Reporter on the Progress of Pharmacy, Journal Editor and Local Secretary, who shall be elected annually by the Council.

#### ARTICLE V. *Funds.*

All permanent and special funds, including those derived from life membership and such as may be bequeathed to the Association or otherwise donated to it, shall be invested by the Treasurer in such securities as may be approved by the Board of Trustees. The interest only of the current year from such funds may be used for defraying the expenses of the Association for that year.

#### ARTICLE VI. *By-Laws.*

By-Laws for the regulation of the General Association as well as for the government of the Council and the Board of Trustees, shall be enacted by the General Association in regular session, and no change in such By-Laws may be made unless notice of the proposed change has been given at the session immediately preceding the one at which the motion to amend is made. No such motion shall be considered carried unless two-thirds of all the votes cast shall have been favorable to it.

#### ARTICLE VII. *Amendments.*

Amendments and alterations to the Preamble or Constitution may be made at any annual meeting, provided notice of the proposed change has been given at the annual meeting immediately preceding the one at which the motion to amend is made. Such

motion must receive three-fourths of all the votes cast before it may be considered as having carried.

C. S. N. HALLBERG, *Chairman*,  
EUG. G. EBERLE,  
CASWELL A. MAYO,  
M. I. WILBERT,  
HENRY P. HYNSON.

Mr. Hynson moved the adoption of the resolution and order as read.

Mr. Whelpley moved that the report of the committee be received, but that the recommendation be not concurred in. He said his reason for making this motion was, that while an enthusiastic and interesting meeting of the Committee on Reorganization had provoked much discussion, nevertheless the undercurrent of sentiment was conservative, and he felt the time was not yet ripe for adopting even this experimental step of suspending the By-Laws and placing in the hands of the Council all of the business of the Association.

Mr. Hynson said that, upon this proposition of referring to a delegate body, or to the Council as now constituted, the whole business of the Association, there was no dissent at all—that it was unanimously adopted: that it was only unanimous action that the committee has sought to have a trial of by this order.

Mr. Hallberg also said that the resolutions were approved unanimously.

Mr. Beringer here seconded Mr. Whelpley's motion, and suggested that this view coincided with the attitude of the retiring Treasurer, Mr. Shepard, as read to the Association, that the Association should go very slowly and deliberately about making any radical changes of this sort. He said he had been trying to come to some conclusion as to what ought to be done, and he was ready to confess that his mind was in a state of turmoil on the question. He had not been able to make up his mind as to what changes should be adopted, and he believed that was the undercurrent of feeling with the majority of the members. Only about one-third of the members attending the meeting was left, and he thought the Association should go very slow in this matter. He did not think the Association should be patterned entirely after any other national association in framing its work. He knew that the delegation of such powers was practiced in other very large associations, but when he had come in contact with individual members of such bodies he had heard their expressions of disapproval, and he feared some such results here. For these reasons, he seconded the motion of Mr. Whelpley, that the Association wait a little longer, for something more definite to take shape, so that the membership might realize fully what it was doing.

Mr. Payne said he had taken part in the discussion himself, and felt like Mr. Beringer. Anything that was for the good of the Association he was anxious to see done, but it seemed to him this question was hardly

in the proper shape to go on with it at the present time. Speaking from his own point of observation, there was not the unanimous sentiment that the presiding officer of the committee seemed to think: there was quite a difference of opinion, and most of the votes were very close.

Mr. Hynson again stated that the first resolution went through unanimously.

Mr. Good thought the proposed suspension of the By-Laws for a year was a radical step, and did not approve of it, even as a recommendation for trial only: thought it was revolutionary. The older members, who have been following the Association for more than a quarter of a century, did not feel like being pushed into the background so completely as this revolutionary system would probably accomplish. He was not a fossil, and tried to keep in touch with natural evolution, but this project did not appeal to him as a proper step, for the American Pharmaceutical Association to thus completely change the character of its organization. He objected to giving to the Council absolute control of the business matters of the Association, without review. This proposition looked toward the ultimate relegation of all the business of the Association to the Council for disposal, with no review or redress by the membership at large, and that would be altogether wrong, according to his view. It would be a case of the creature dominating the creator. He recalled the time when a change was made in the organic law making it impossible for a member to succeed himself in the Council, because of the hue-and-cry raised about a "clique" being formed to perpetuate themselves in office; and yet this shaft was aimed at some of the Association's most honored and worthy members. Of course, an unnecessary amount of time is consumed in reading the details of the Council's work, but he felt impelled to raise his voice against this proposed suspension of the By-Laws, as he considered it entirely too radical a step, even as a temporary measure, because he saw in it a purpose to make it final.

Mr. Roehrig also raised his voice against the proposed change. He saw here a very small percentage of the membership of the Association—even of those who had attended the meeting—and he doubted the wisdom of this handful of members tying up the business affairs of the Association for an entire year; it was too radical a change in the method of doing business. Besides, there seemed to be no very great hurry for making a change. The committee should continue its work, and no doubt they would evolve something in time that would be an improvement. He hoped the motion of Mr. Whelpley would prevail.

Mr. Oldberg said this was the first time the Association has ever had any sort of definite proposition to consider, but did not deem this sufficient, and thought that when the Association was ready for reorganization a still more definite and carefully-considered plan should be presented, published and digested for a year before taking any action.

Mr. Hallberg spoke as a member of the Committee on Reorganization, and said he believed one reason why there were so few at this final general session was because a solid week was too long a time for the annual meetings to extend over. He knew of no other national association that devoted so much time to its meetings, and the effort was to concentrate it into not exceeding four days, so that the members could come to the meetings and be at their homes again within the compass of a week, instead of having to take ten days or more to attend a meeting, as with this Association, which requires both more time and money than the average man can spare. While not attempting to pattern after any other association, the committee had studied the practice and conditions surrounding other associations, and had picked out what they thought best suited to the needs of this Association.

Continuing, Mr. Hallberg said he did not see how it was possible to object to the principle of delegating to the Council all the business, proper, of the Association—although that, of course, would mean the enlarging of the Council, so as to be more representative. This would give the Sections more time and increase the number of sessions, thereby obviating the necessity of reading many papers by title only, as is now done. He again took occasion to pay a high compliment to the paper read by Mr. Beringer at this meeting before the Section on Practical Pharmacy and Dispensing, but regretted the limited time allowed for its discussion and the small number present to hear him. The idea expressed by some that the proposed action was revolutionary seemed to him not well taken; it was really a return to the original plan pursued for the first twenty years of the Association's history, when it was practically conducted by delegates from the pharmaceutical colleges and perhaps one State association—that of New Jersey, the only one existing at that time. He thought the members had had ample opportunity to study this question, as two different drafts had been presented and published in the Proceedings and in the *Bulletin*, and the members had been solicited to express their views; the delinquency was their own for having failed to do so. He concluded with a plea for some unanimity of sentiment, if possible, on this question of referring all business matters to the Council, so that the Committee would be encouraged to try and do something.

Mr. Eliel reminded the members that this proposition was supposed to be tried for one year only, and if it did not work out well it could be given further trial at the end of a year, or dropped. There would be no particular change in the *personnel* of the Council during that year, and, as he understood, the object was to relieve the Association and save a great deal of time that is now being wasted in reading over all the petty details of the proceedings of the Council—time which might well be used to better advantage. He was certainly heartily in favor of trying this thing. The Association could always upset it if it did not turn out well. Every mem-

ber of the Association knows that the Council transacts all the business of the year, even to spending money, and at the end of the year the Association approves its action. He could not remember, in the last twenty-five years, that the Association had ever disapproved of the Council's action in the *interim* between meetings, but he did recall that a great deal of time had been wasted in quibbling over nothing.

Mr. Eberle did not think there was anything in the idea advanced that the members would have no redress against the actions of the Council if this proposition prevailed. The Council, in self-defense, will always do what is to the best interest of the Association, because the Council members themselves have the sincerest interest in the welfare of the Association, and that the business transactions of the Association may be managed in such a way as to reflect credit on their administration. It was a representative body, and very frequently many members of the Association not members of the Council, are present at its deliberations. Besides, the proposition is, to try this matter for one year only, and then if found unsatisfactory, it can be changed or discontinued. He hoped the resolutions submitted by Mr. Hynson would prevail.

Mr. Roehrig, commenting upon Mr. Hallberg's remarks, said he had seen frequent mention made of the fact, but he had yet to see the first thing published of any form proposed to be adopted, and was sure there was no suggestion that could be shown in the *Bulletin* or *Proceedings*, whereby the proposition was set up that this Association was to run an entire year without any law. This proposed action would tie the Association up, and it would have no law to guide it. He was afraid it would be a dangerous experiment.

Mr. Hallberg responded that the fundamental law as found in the Constitution would still prevail. Mr. Roehrig replied that if it was not necessary to have By-Laws, "why be bothered with them at all?"

Mr. Edward Kremers said that up to within a few hours—or days—ago, he had been heartily in favor of the reorganization of the Association; he had been inclined to favor the idea of empowering the Council to transact most of the business of the Association. He realized that there were many advantages in proper concentration, but realized that there were disadvantages also, and it had come to the point of balancing these advantages and disadvantages. Heretofore, he had been inclined to the view that the advantages might be greater than the disadvantages. But when a member of the Council, that is to be entrusted with the powers of this body, can come before the Association and tell the members that no reasonable person can possibly object to do so and so, he for one would withdraw his support from the proposition to leave all business to the Council. He did not say that the majority of the Council would feel this way, but give absolute power to any person, and it is but human to exercise it.

Mr. Good, speaking to Mr. Hallberg's remarks about concentrating the



work of the annual meetings into some three or four days, made a plea for those members who desire to attend all the Section sessions, but who would be deprived of this opportunity by having simultaneous sessions of some of the Sections, as suggested. He thought the Association had struck the happy medium in the present plan of devoting a whole week to its work, thereby giving the members interested a chance to know all that was going on.

Mr. Hallberg still thought this scheme would appeal to the convenience of the greater number, and humorously suggested that the attempt to attend all the Section meetings would be "too great a strain on the intellect, anyhow."

The Chair then put the vote, by division, on the Whelpley motion to receive the report, but not to adopt the recommendation made to suspend the By-Laws for a year and refer all business to the Council, and the vote stood 25 for adoption to 14 against, and the Chair declared the motion carried.

Mr. Beringer moved that the Committee on Reorganization be continued, and Mr. Roehrig amended to the effect that it be continued, and that it present a complete set of new By-Laws for consideration and action next year.

Mr. Oldberg thought that at least some of the members who voted for the Whelpley motion were not opposed to the proposed plan, but simply did not think the time opportune for any definite action, and he thought it would be a mistake to instruct the committee to bring in some plan next year. What the members would like to have would be a definite plan now to consider, so they could be thinking it over and be in a position to act intelligently next year. The whole scheme has been in a formative stage up to this time, and it will be the same next year unless something is prepared and published in the meantime for the members to examine and think about, as as to be able to take some action at the next annual meeting.

Mr. Kraemer thought that while the members generally were in favor of a reorganization on general principles, the difficulty was that those who were opposed to any change of plan at the present time did not suggest along what lines they would be willing to economize the time of the Association, and that there was no question but that it would be a flat failure if the Association, attempted now to co-operate with the N. A. R. D. or any other Association and continue to prolong its meetings as it has done.

Mr. Good said he would be willing to consider the plan of simultaneous sessions of the different Sections, if it should be found to be the general desire to compress the business of the Association into four days. However, there was no way to do that, in his judgment.

Mr. Mayo, in reply to the criticism of the committee made by Mr. Oldberg, referred him to the Proceedings for 1907, where would he find a definite, clear plan of reorganization, covering every necessary point of

same, submitted by the committee and published a year ago. Also, to an alternative plan, submitted by Mr. Hynson and printed in the Proceedings and "Bulletin." He thought if there has been any laxity or fault, it has not been on the part of the committee, but on the part of members in not taking the proper steps to arrive at what they want. As a member of the committee, he was quite sure that they wanted to give ample time to consider the matter, but he thought the members should not procrastinate in their duty to inform themselves on this question.

Mr. Edward Kremers entered his protest against the statement made that those who had voted against the plan of representation had not done anything. The Proceedings would show a resolution offered by him several years ago, when a member of the Council, providing that while each section was to have one session without interference by other sections, all subsequent sessions should be held simultaneously. This resolution was not adopted, and was even opposed by some of the gentlemen who are now inclined to criticise. Twice in recent years, by his consent, the Historical Section has given way to special general sessions and its sessions held at the same time with other sections, and both times the Council took up the time of the Section, and kept even its officers (also members of the Council) from attending the sessions.

Mr. Roehrig here withdrew his motion to continue the committee, and instruct it to bring in a set of by-laws next year, and the Chair put the vote on the Beringer motion to continue for another year, and it carried.

Mr. Kremers, as Chairman of the Committee on Proposed Pharmaceutical Collection at Washington, made verbal report of progress only, stating that, under the building conditions at Washington, nothing could be done at the present time.

Mr. Mayo called attention to the fact that it had occasionally happened that a paper not quite up to the standard had been accepted by the Chairman of a Section—necessarily a temporary officer, and not always possessing editorial judgment—and gave notice of his purpose to introduce an amendment to Article IV, Chapter X of the By-Laws, so as to place the matter of final acceptance or rejection, before presentation in the Section sessions, with the Committee on Publication.

The General Secretary, as Chairman of the Publication Committee, opposed this suggestion, as he said it would be imposing a practically impossible labor upon the Committee, in view of the large number of papers presented, and because this matter was already sufficiently taken care of in the By-Laws, which, while vesting censorship of papers in the Section officers, clothed the Publication Committee with final authority as to publication.

Mr. Mayo did not press the matter farther.

The President stated that the time had now come for the installation of the officers-elect. But, first, in closing his labors, he wished to thank the

Association very heartily for the kindness and forbearance shown him during the past year and for the generous appreciation of the members of what he had endeavored to do, as well as for their kindness in overlooking his shortcomings—his sins of omission as well as sins of commission.

The Chair then called on Mr. Francis B. Hays, of New York, as a committee of one to bring the newly-elected President to the rostrum and present him to the members.

Mr. Hays performed this duty, and escorted president-elect Oscar Oldberg, of Chicago, to the stand, where he introduced him as one of the Association's oldest and most honored members, selected to succeed Mr. Searby as its chief executive.

President Searby said it afforded him great pleasure to welcome Mr. Oldberg to a position that he was in every way qualified to fill, and it gave him happiness to pin upon the lapel of his coat the insignia of his high and important office, the gold badge of the President of the Association. He then presented Mr. Oldberg to the members, as the next President of the American Pharmaceutical Association.

Mr. Oldberg said :

Fellow members, I shall not make a speech. I shall simply say this: That it is my intention to perform my duties with care, diligence and fidelity. But I want you to believe that I am a conservative man. I have been connected with the Association for thirty-five years, and it is in the Association that I have learned lessons which teach me to be conservative. I want you one and all to feel, not simply that you are free to make suggestions to me, but that I want you to do it—I appeal to you to make suggestions. I thank you all most heartily for this evidence of your good will and confidence.

At request of the Chair, Mr. Hays next escorted First Vice-President E. G. Eberle, of Dallas, Texas, to the rostrum, and introduced him to the retiring President. Mr. Searby welcomed him, and in turn presented him to the members. Mr. Eberle said he was appreciative of the honor conferred on him. His chief duty, as he understood, was to aid the President, and he would not only be glad to perform that duty, but any other that he might be called upon to perform to the best of his ability.

Mr. Hays next brought forward Second Vice-President William Mittelbach, of Boonville, Mo., and introduced him, and Mr. Searby welcomed him and introduced him to the Association. Mr. Mittelbach thanked the members for the honor conferred, and said he supposed the Association wanted an ornamental attachment, and so had gone to Missouri for it. He promised to do his part.

Third Vice-President Jas. H. Beal, of Ohio, was not in the room, and could not be installed.

Mr. Hays was next called on to bring forward the new Treasurer of the Association, Mr. Henry M. Whelpley of St. Louis, the successor to the veteran Samuel A. D. Sheppard, of Boston, who had held the office for twenty-two years, to the great satisfaction and advantage of the Associa-

tion, but who had been compelled to decline re-election by reason of weight of years and present ill health. Mr. Searby welcomed Mr. Whelpley, and said he knew of no man in the Association so well fitted to step into Mr. Sheppard's shoes and do his work.

Mr. Whelpley thanked the Association for the distinction and honor conferred on him. He realized fully, however, that it was not the mantle of Sheppard the man and much-loved member of this Association that had fallen on him. He went away back to 1875, a third of a century ago, and nine years before he himself ever attended a meeting, and recalled Mr. Sheppard's splendid services as Local Secretary of the meeting in Boston that year. This brought him at once into prominence as a valuable member of the Association. Eleven years later he was elected Treasurer, and had served continuously ever since. Mr. Whelpley well remembered that meeting, and the discussion which was caused by the condition of the affairs of the retiring Treasurer. Mr. Sheppard assumed the duties of the office, and gradually built up a system of finance, rules and regulations in regard to the funds of the Association, until to-day it has a system of accounts that is well-nigh perfect for its purposes. Year by year the organization learned to know, honor and love Mr. Sheppard, until little by little the members forgot about him as Treasurer and thought of him as a man. His strong personality entirely submerged the office as Treasurer. Mr. Whelpley said he spoke of these things, because he fully realized that what had been done here was to fill the office of Treasurer only; he was aware that he in no way filled the place held by Mr. Sheppard as a man. He realized that the mantle of Sheppard as a member of the Association had not fallen upon his shoulders, but had been gradually settling upon the shoulders of each and every member of this organization, not only those who have attended the meetings, but those who in various ways had come under the influence of Mr. Sheppard's magnificent personality. (Applause.)

The next officer-elect brought forward by Mr. Hays was Mr. C. Lewis Diehl, of Louisville, Reporter on Progress of Pharmacy for nearly a third of a century. Mr. Hays introduced him as "not a new *deal* by any means;" to which Mr. Searby promptly and happily added, "but a very *good deal*!" (Applause.)

Mr. Diehl thanked the members for this continued evidence of their favor, and said it was quite a privilege to say a few words on this occasion. He had been Reporter on the Progress of Pharmacy for so long a time that he might almost say he went back to 1866 or 1867, when he was Chairman of the Committee on the Progress of Pharmacy, and made reports at that time. He said he would continue to do as in the past, and if possible improve upon his work. He again thanked the members for their kindness.

When Mr. Hays brought forward the General Secretary for re-induction into office, the latter said that it was a wise provision in the By-Laws that

the so-called permanent officers must be elected every year. While the term "permanent" has been applied to several of the officers, it does not possess that force which it ordinarily carries with it, and the Association had wisely decided that, annually, the decision shall be made as to the continuance in office of the men selected to perform certain duties. He felt very grateful, indeed, to the Association for this renewed expression of approval of his acts as Secretary. He was now entering upon his fifteenth term in this office, and felt more keenly than ever before its responsibilities. He could not promise to do any better than he had done, because that would be saying he had not done as well in the past as he could have done; but he would say he would try to continue to please the members of the Association in the work that had been assigned to him, and hoped a year hence to be able to show that there had been no retrogression in the office of the General Secretary.

Mr. Hays brought forward and introduced the new Secretary of the Council, Mr. Joseph W. England, of Philadelphia; and the Chair welcomed him and presented him to the members. Mr. England was very brief, contenting himself with saying that the American Pharmaceutical Association typifies all that is best in American pharmacy, and he was proud to serve, not only in the ranks of the organization, but also as an official.

The Secretary stated that the next thing before the Association was the installation of the new members of the Council, but that only Mr. Searby, the retiring President, was present; Mr. Sheppard, of course, was not present at the meeting, and Mr. Hynson had been so overcome by his modesty and natural disinclination (!) to appear in public that he had disappeared from the assembly hall. So only Mr. Searby could be installed, and he briefly thanked the members for the honor.

President Oldberg here took the chair.

Mr. Kraemer moved a vote of thanks to the retiring officers for their zeal and enthusiasm in contributing so much to the success of this meeting and making it one of the most memorable in the history of the Association, and for contributing in more ways than one to the development of the "Greater American Pharmaceutical Association."

This motion was seconded by Mr. Beringer and others, and carried unanimously.

The Chair called for new business, but none was offered.

There being no further business before the Association, on motion of Mr. Searby, the Convention adjourned *sine die*.

# MINUTES

## OF THE

### SECTION ON COMMERCIAL INTERESTS.

---

FIRST SESSION—TUESDAY AFTERNOON, SEPTEMBER 8, 1908.

The first session of the Section on Commercial Interests was called to order by Vice-Chairman A. V. Pease, of Fairbury, Neb., in the absence of Chairman Jacob Diner, of New York, at 3 : 30 p. m.

The Chair called attention to the absence, also, of Secretary Young, of West Virginia, and suggested the selection of someone to act in his place. On motion of Mr. Apple, of Philadelphia, Mr. Harry B. Mason, of Detroit, was unanimously elected Secretary *pro tem*.

The Secretary announced that the first order of business was the reading of the Chairman's Address, which had been printed and copies laid on the table for the members. He read the Address as follows :

#### CHAIRMAN'S ADDRESS.

*Gentlemen:* Recognizing the fact that a chairman's address is always considered somewhat of a nuisance, the music before the play, something to get over with as soon as feasible, I shall have as little to say as possible. From time to time this Section has been considered an unnecessary appendix to the Association, and numerous have been the attempts to legislate it out of existence. Yet it is my firm belief that the stronger you make this Section, the stronger will the organization become, and the more interesting you make these sessions, the more numerous will become the applications for membership from retail druggists. A good deal has been said about pharmacy as a profession, yet we must not deliberately close our eyes to the fact that pharmacy, or rather the pharmacy, is no less a trade, and daily becoming a more and more important factor in the commerce of the world. So while I do not by any means advocate the elimination of the ethical or professional side from our calling, yet I must insist that the commercial side is of importance second to none. It is my firm belief that if the pharmacist would be a better merchant, he would be in a position to help along the professional side to a far greater degree than he has heretofore done. This may seem paradox, yet it is a fact nevertheless. Hard commercial facts, such as paying rent, meeting bills, etc., are daily confronting and—I believe I may justly say—distressing the retail druggist, and because he is too poor a business man to make proper arrangements for these daily

necessities, because they are ever-recurring troubles, keeping his nose to the grindstone, he has not the time nor the mental composure to give the proper attention to the professional and ethical side of his calling.

I shall not take up your time nor try your patience by giving you a résumé of the commercial activities in pharmacy during the past year. Those who read pharmaceutical papers are as well, if not better, posted than I am, and those who do not read the papers are not here, and would not benefit, therefore, by such a repetition.

The ethical side of our calling, the prescription department, is of course an important factor, yet we must not forget that the metamorphosis in medicine has greatly influenced the prescription business, and no longer can the pharmacist depend upon that branch for the main part, if not for all, of his income. Christian Science on one hand and the Fresh Air cure and antitoxins on the other have affected our prescription department to a serious extent, and we are necessarily driven into other and newer fields to supplement our revenue. Pathological work, of course, is open to us, but not all pharmacists are gifted in that direction, and we must look to the commercial end of our calling to give us that remuneration which our investment and our labor entitle us to. How to make the drug-store pay is the serious consideration before you, and I trust with your assistance we will to-day take a long step in the direction of solving this eternal puzzle.

Besides a number of very interesting papers, the following questions will be discussed at this session :

#### QUESTIONS.

1. Does the post-office station, sale of stamps, city directory, etc., benefit the store?
2. The commercial value of taking your clerk into your confidence.
3. Does the present scale of remuneration bring into our fold the necessary number and the right kind of help, and if not, how to remedy it?
4. The value of window display and the kind of goods to display.
5. The trade in spices; and the druggist's share thereof.
6. Are the druggist's "own" preparations of real benefit to him, and what kind of remedies should be selected.
7. The confidence of the public is a valuable asset, and how to get it.
8. The advantages of coöperation with the N. A. R. D.
9. The sale of "patent" medicine is acknowledged to be a somewhat necessary evil. How far should the druggist go in pushing or discouraging it?
10. The pharmacist as a citizen.

The Chair suggested that the Chairman's Address might be likened to music in church, which composed the mind to worship, and expressed the hope that the address might similarly compose the minds of the members to serious interest in the work of the Section. He reminded the members that the object, at last, of all pharmaceutical associations was to enable the pharmacist to use to the best advantage his skill, time, talent and labor, and he hoped each one would give his experience, and let this be a regular "experience-meeting," thereby making it as profitable as possible.

Mr. Hynson moved to accept the address of the Chairman with thanks, and that it be given consideration at this time.

This motion was seconded by Mr. Apple and carried.

Mr. Hynson then moved that the first paragraph of the address be referred to the Council, as the sense of this Section as regards the work of the Section, and as regards the work of commercial pharmacy. He

thought it expressed the idea as clearly and as tersely as could be done. He said there had been a tendency in some circles, as the Chairman suggests, to look upon this Section as a sort of "appendix," that might well be removed.

This motion was seconded by Mr. Ladish, of Chicago, and adopted.

The Chair stated that a number of members had sent in answers to the queries propounded by Mr. Diner, and that these answers were in print and would be distributed to the members present.

The Secretary proposed that Mr. Hynson read his list of answers first, and he did so as follows :

#### ANSWERS TO SOME OF THE QUESTIONS PROPOUNDED.

BY H. P. HYNSON.

No. 1. The simple sale of stamps and the city directory, both as accommodations, are of great benefit to the drug store ; the absence of these gives an impression of narrowness and want of enterprise. Post Office Stations are, in my opinion, a distinct disadvantage and a distinct means of lowering the dignity of Pharmacy.

No. 2. A clerk who is worthy of the trust should, by all means, be "taken into your confidence" and just so far as he *is* worthy, every clerk should be so taken. It helps the clerk to understand conditions and leads him to be careful, economical and energetic.

No. 3. The present *scale of remuneration* has very little to do with the kind of help ; that is regulated by exactly the same influences that prevail in other lines. It is the long hours and the unusual hours that make pharmacy objectionable. Do all the work possible between 9 a. m. and 6 p. m. and have a distinct shift for the balance and you will make pharmacy one of the most attractive vocations to enter.

No. 4. Window displays, on a busy thoroughfare, kept fresh and attractive, are valuable advertisements and need not be changed as frequently as is demanded for a residential point, where they are of little value and if not of the best form, are decidedly hurtful. I believe windows less like store windows and more dignified without displays, would be more effective in retired locations. The character of goods used for displays should be novel and fresh; not too great a variety at a time ; a consistent and connected assortment is the best. And never of a character to offend refined and sensitive natures.

No. 5. Spices are certainly a much more consistent and profitable "side line" than many that are carried in pharmacies. They are required to be kept in stock for medicinal purposes. If the sale of these may be extended without detracting from the better work or without antagonizing the grocers in your neighborhood, there seems scarcely a good reason why spices should not be pushed.

At this point, Vice-Chairman Pease asked that he be relieved of the



duty of presiding, on account of difficulty in hearing, and on motion of Mr. Hays, seconded by Mr. Hynson, Mr. Mason, the acting Secretary, was designated to preside for the balance of the session.

Mr. Eberle, of Texas, thought it might be well to make an exception to the rule of not reading papers of absent authors, as the answers to the questions in the Chairman's Address were short and to the point.

Thereupon the Chair requested Mr. Eberle to read the list of answers submitted by Mr. W. S. Elkin, Jr., in his absence, first reading the question asked by the Chairman and then the answer submitted. Mr. Eberle very readily consented to this, and read the following from Mr. Elkin :

#### ANSWERS TO THE CHAIRMAN'S QUESTIONS.

BY W. S. ELKIN, JR.

I was not aware that I was expected to have anything to say on these questions until I saw a notice of it in the last issue of the Bulletin. My time for writing this paper, therefore, was necessarily so limited that what I shall have to say will be very brief.

No. 1. Does the postoffice, sale of stamps, city directory, etc., benefit store.

If your store is located in the suburbs, Yes. If in the busy section of the city, No. There is no question of doubt but that the postoffice station, the sale of postage stamps, the free use of the city directory (but I do not advise the free use of the telephone), and other inexpensive accommodations of this character are drawing cards and an advertisement for your place of business. In a residence section of a town it is necessary to a certain extent to humor the whims of the old and young. In other words, it is necessary to popularize your store. If your location is such that people will not drop into it as a matter of convenience, you *must* handle something that they are constantly in need of. Besides the clerk in the suburban store is not *always* busy, and the sale of such articles always being cash, it only requires a little exertion on his part and not an outlay of money that is not returned to the cash drawer in a very short time.

No. 2 and 7. The commercial value of taking your clerk into your confidence, and the confidence of the public is a valuable asset, and how to get it.

These two I think might properly be answered as one. The clerk should undoubtedly have a certain amount of your confidence. No one doubts that the confidence of the public is a valuable asset. This admits of no discussion, and I cannot imagine any surer way of getting it than by being honest, fair and square in all your dealings; convince your clerks on this point, inspire them with your confidence in *them* as men, and at the same time inspire their good-will and their esteem. If your clerk is thoroughly impressed with your honesty, and with your desire to do business with your customers as you would have your customer do business with you, the con-

fidence and good-will of the public is obtained through just as many avenues as you have clerks. I believe one should be just as careful to correct an error in one's own favor as if it were in the customer's favor. Not once and not purely for a show to attract attention, but because it is right. If you were a customer of a drug firm and the proprietor treated you in this manner, and you noticed the same treatment on the part of their clerks, would you think for a moment of transferring your drug account? This rule should apply in your advertising as well as from behind the counter. State facts from the columns of your daily papers. Success may seem a little slow at first, but in the end you will have the leading drug business of the town, where your opponent, who takes a different view of such matters, will be begging for business.

No. 8. The advantage of co-operation with the N. A. R. D.

This is a very broad question, and has already been discussed, pro and con, by some of the ablest members of both Associations. I for one believe when the time is ripe, there should be a co-operation. There is undoubtedly more to be gained in the co-operation of two national bodies of this character than there would be, should the two bodies, as they stand, not always agree on the same national issues. There is the same reason for co-operation between the two Associations as there would be for our members to co-operate and form an organization. There are older and wiser members in this body than I and whose wisdom I respect, who may take issue with me, but I feel quite sure I could cite instances in the past year or two where if the same exertion and influence given by each organization were combined as one, the effect of us as individual members would have been much greater.

No. 9. The sale of "patent" medicines is acknowledged to be a somewhat necessary evil. How far should the druggist go in pushing or discouraging it?

Since the passage of the Pure Food and Drug Act and the different narcotic bills passed by many of the States, I see no reason for the druggist to worry himself over the average patent medicine that is sold over his counter. The sale of patent medicines is a legitimate drug business, and should be conducted the same as any other branch. My estimate is that 75 per cent. of the sale of patents are made directly to the customer who calls for what he wants. In many sections of the country it is quite a large item of the drug business, reaching from 25 per cent. to 40 per cent. of their sales. Should we discourage the sale of patent medicines to any great extent, it is only a question of time when this branch of the business will be switched to the grocery store, or some other avenue that the proprietor might select to distribute same. I do not see the particular advantage of pushing the sale of patent medicine, nor the necessity of discouraging the same.

Mr. Eberle also, at request of the Chair, read the answers submitted by Mr. George A. Gorgas to the questions proposed :

## A FEW SUGGESTIONS.

BY GEORGE A. GORGAS.

My store being located within a square of the postoffice, we have no sub-station, but although so close to the public office we have a large sale of postage stamps, and consider the time spent in passing them out one of our best advertisements. The same applies to the city directory and all other accommodations which we can give the public.

The question of help in a drug store is a very serious one. I do not know whether it is the cause of low wages, the long hours or the constant care which must be exercised by drug clerks which causes so many of them to discontinue and seek other fields. The drug clerk does not receive the remuneration he deserves, but with the large number of stores existing in every town I do not see how it is possible to expect an improvement in that respect. The probability is that the larger stores will be enabled to pay sufficient to command the highest grade of help, but the average store has a proposition hard to overcome. I regret that I cannot suggest a remedy.

The window display is the best advertisement a store can have. The kinds of goods to display is the kind people will buy, whether they be drugs, toilet articles, cigars, or the druggist's own preparations. The progressive drug store of to-day is a diminutive department store. The window is the most expensive part of the store. We should, therefore, not decline to add anything to our store which we can display, and we should gladly put in the window anything that the people can be induced to buy. The druggist's own preparations, if properly prepared, are of real benefit to him. He knows their composition, he knows their weak points, and he knows all their good ones. He can, therefore, speak confidently about them, and can back them up with his personal guarantee. The goods to be selected, I think, would vary in the several parts of the country. I personally have not been as successful in pushing the sale of my own preparations as I should have been, and I realize I have not taken advantage of all my opportunities ; but the best asset a druggist can have is a line of preparations which he has been advertising in his store, in his window, in circulars, and possibly newspapers, for a number of years, as the sale on those things will continue almost indefinitely. That is one of the means of gaining the confidence of the public. If your preparations are right, the people will find it out and have confidence in you. In order to secure that confidence you must be absolutely honest with the public. Tell the truth, whether the result is to your advantage or disadvantage, and it is only a question of time until the public will respect your word and have perfect confidence in you.

I think it is almost a necessity for a druggist to co-operate with the N. A. R. D. That organization has been the means of creating harmony in many places where nothing but discord existed. It has been the means of advancing the prices of patent medicines, not only directly by its representatives working among the druggists, but indirectly from the moral effect as seen by the profession. In many places the full prices, which were secured with the instrumentality of the N. A. R. D., have been maintained, even though those contracts have been annulled. The patent medicine business may be a necessary evil, if evil it may be termed, but I believe that every druggist, unless surrounded by physicians from whom he receives a large patronage, should push the sale of patent medicines. The public wants them, and it is our business to supply them. I make it a rule not to recommend anything unless it is guaranteed to me by the manufacturer personally, but when it is so guaranteed I do not hesitate to recommend it to the public, at the same time calling their attention to some remedy we have either made up ourselves or one of which I know the formula.

If the above ideas are of any value to you, you are welcome to them.

The Chair stated that, without objection, the answers submitted by Messrs. A. E. Magoffin, Chas. E. Willets and R. S. Beasley would, in the absence of the authors, be received without reading, to take the usual course. So ordered.

Said papers here follow :

#### HERE AND THERE.

BY A. E. MAGOFFIN.

While I am not a member of the A. Ph. A., yet I thought I might open my mouth via the pencil route and say a little in answer to some of their questions in the February Circular.

1. Does a postoffice, sale of stamps, etc., benefit the store?

Ans. I had the postoffice in my store room in Ohio for seven years, and in Lyons, Kans., we have sold stamps for about six years, and I can't see that as a money-making operation it was a success, so on the whole I vote *no* from experience.

2. Commercial value of your confidence in the clerk.

Ans. It depends on the clerk. If he really wants to progress, your confidence will be appreciated and will result in better service, hence *worth more to you*. The commercial value of such a clerk cannot be estimated altogether in dollars and cents.

3. Salary depends upon the employer as well as the employee. If the clerk shows a *willing* desire to be a *clerk*—not an automaton—his work should be appreciated by the employer and salary *offered* (not wait to be asked for).

## 4. Spice trade.

In my early drug life we had a good spice trade, but in later years the grocer has caught a large share by selling cheaper goods—*just as good*. Now, since the Pure Food and Drug Law is in force, the spice trade ought to revive.

## 5. "Own" patents.

They are a *lasting benefit*, just so long as you do not *push* them out in lieu of other goods called for. I had some 20 kinds, but I sold them on *their* merits only. Lots of people leave the *choice* of a cough syrup, etc., etc., to the druggist; *then* is his time to sell *his own*, but be careful that the *standard* is the *best*, so Mr. Customer will come again.

6. Confidence of the public can be obtained by dealing *squarely* with *every one*, irrespective of "*age, sex or previous condition*."

One man's money is as good as *any* other man's, and when the public find that you deal *squarely*, honestly and kindly—same to all—they will *stand by you*.

## 7. Evil of patent medicines, etc.

I do not believe in *pushing* their sale, *i. e.*, recommending promiscuously as cures of all ills. The druggist reaps no Standard Oil profit on patent medicine sales. Let him cultivate a square deal with the doctor and with the customer and get prescriptions. There's more money and a wonderful lot of greater satisfaction to both druggist and patron.

## THE TRADE IN SPICES AND THE DRUGGIST'S SHARE THEREOF.

BY CHAS. E. WILLETS.

The druggist's share of the spice business, to my mind, is all of it. That may sound selfish but the druggist knows, or should know, how to buy spices, also how to test them, and therefore is in a position to handle pure, unadulterated spices and these facts should convince the public that the place to buy spices is at the drug store. We have always enjoyed a nice trade in spices but noticed that the grocers were enjoying the same blessing, so early last spring we had some counter slips printed, costing \$1.50 per M., and they set forth the fact that our spices were pure and unadulterated, much stronger than the kind they had been buying and would comply with any pure food and drug law. A list of the spices was given below. These counter slips were put into every package leaving the store, with the exception of physicians' prescriptions. This form of advertising was kept up all summer and at the beginning of fruit-canning season an advertisement was run in the local paper. People came in and asked for some of the spices we were talking of all spring and as a result our spice business was four times as large as it was the previous year.

## PUBLIC CONVENIENCES ARE GOOD ADVERTISEMENTS.

BY R. S. BEASLEY.

I do not know much about a post-office station. Do not know enough about it even to think about it in its relation to the average drug store. Never saw one in any drug store anywhere.

But when it comes to the beneficial effect accruing to the store that keeps a city directory and makes a specialty of the sale of stamps, through the gratefulness and appreciation of the public, I might be reasonably expected to offer some opinion, if not information, upon the subject.

Several years ago, wife and I made a journey to Memphis, arriving there about 7 or 8 o'clock in the morning after an allnight ride in a sleeper. This was my first experience with one of Mr. Pullman's beneficent institutions and it did not seem to agree with my constitution. Nerves were shaky, head felt queer and all that. So, after having reached our hotel and finding that my bath had not entirely restored me to my usual spirits, I thought I would hunt up a drug store and get a glass of Bromo-Seltzer—one of the things that I had so many times sold to people who seemed to be in just such a condition as was mine.

Found the drug store all right. It was a nice store too, beautiful fixtures, splendid arrangement of stock, that is the ensemble looked good to the eye. Asked for a Bromo-Seltzer, was served neatly and quickly. Said to the gentleman who served me "Don't reckon you happen to know a Mr. Word in your city, do you?" He replied, "Who, Mr. B. A. Word? Yes, I know him well. He comes in here five or six times a day, buys all his cigars and soda water here, don't think he ever takes any medicine, he don't look like he was ever sick a day in his life. Are you a friend of his? Well, he will be glad to know that you are in town. Just step over, there to the phone and call him up; he has just about now reached his office. That's a free phone."

Well, I got Mr. Word on the wire, he was glad to know I was in town, and he said so. Invited my wife and myself out to dinner with him and his family but unintentionally, I am sure, forgot to mention where he lived. I smilingly remarked that I perhaps had better call him up again to get the desired address when the clerk said "That's not necessary, he lives out on Adams Avenue," and turning to the city directory gave me the number of the house with directions about which car to take to reach it. Before I had time to thank him for his kindness, my wife stepped up to show me some postal cards which she had purchased from another clerk in the store on which she had written greetings to the folks at home, and these greetings were written with a fountain pen belonging to the clerk who waited on her. So after expressing our thanks to all parties we started out to hunt a mail box in which to deposit our postals when one of the clerks said "just drop your cards in that mail sack near the door, we

keep that sack there for the convenience of our friends and we send to the Post Office four times a day. "Thank you" said we. "Good morning. Come in again," said he.

Well say! I left that store feeling as well as I ever felt in my life and feeling sorter mellow toward everybody in general and that store in particular. Needless to say that I concentrated my purchases in favor of that store during my visit in Memphis.

Hence my belief is that public conveniences mixed with a little tact and courtesy go a long way toward making customers out of the newcomer which pays a very large per cent on the investment.

The Chairman's address and the answers submitted to his queries were here declared open for discussion, and Mr. F. W. R. Perry, of Detroit, led off, at request of the Chair. He thought these questions were both practical and interesting, and said they had been answered in substantially the same way he would have answered them. He did not believe in patent medicines, and never recommended them under any consideration. A little judicious advertising of spices he had found to be quite effective. He thought this business properly belonged to the retail druggist, and not the grocer, in whose hands the quality had gone down along with the price. He heartily endorsed the N. A. R. D., and hoped the Section would give some expression that would make the National Association feel that it was heartily in accord with it.

The Chair called on Mr. Osseward, of Seattle, as a member who could probably throw some light from practical experience on the proposition of the druggist's own remedies as propounded in the query.

Mr. Osseward said he did not believe in patent medicines, and did not want them in his store at all; he did not think they belonged to the drug business. As to pharmacists' own preparations, he thought there might be a few in the toilet line, but he did not believe in keeping these things to interfere with the prescription business. It is not compatible to put up preparations of your own to cut the physician out of his regular business. He had found it best to leave them entirely alone, and in that way his prescription business had been built up. In his city, where there are a great many drug-stores, some of them established for twenty-five years or more, he had, in four years' time, built up the largest prescription business in the Northwest, and he had done it simply because he had stood by the physician. Such results as he has attained can only be attained by square dealing, by giving the customer what he asks for, by refusing to counter-prescribe, and by refraining from pushing your own preparations over the counter.

In answer to a question by Mr. Hynson as to whether he did not put up such things as witch-hazel, beef, wine and iron, cough syrups and the like, Mr. Osseward replied in the negative, saying they were strictly prescription druggists.

Mr. W. M. Bowman, of Toledo, thought that while it might be possible to attain the results Mr. Osseward had described in the Far West it could hardly be done in the Middle West and in the East. One thing he wanted to call attention to was the very objectionable labels on some of the druggists' own preparations. He had known druggists who labeled them in such way as to bring the blush of shame to even a patent medicine man—labels that made as outrageous statements as any patent medicine man would make. He believed in putting up certain preparations, but believed in labeling them so that the physician could take no exception to them. At the same time he had a preparation of horehound, honey and tar, for home consumption, and he labeled it something like this: "This preparation is intended for the immediate treatment of coughs and colds: it is not recommended as a cure for anything, and in severe cases a physician should be called at once." In other words, his motto was, to tell the truth, and not exaggerate the merits of preparations.

Mr. Apple said he wished he could do a pharmacy business like the gentleman from Seattle had described; that was certainly an ideal way to conduct a pharmacy. The vital point of demarcation between what is proper and improper is in the labeling; if the pharmacist stops at the right point, no offense will be given to the liberal-minded physician. As to the putting-up of preparations in the druggist's own laboratory, it is a question whether it is advisable, except for very simple remedies—particularly if attempted to be sold in lieu of patented preparations. The customer is apt to think you are making a greater profit, and that you are insulting his intelligence by suggesting what is good for him. He favored giving the customer what he asked for, and never to offer any advice unless solicited to do so. The druggist that recommends a thing he does not know the composition of is a violator of the public's confidence.

Regarding the post-office proposition, Mr. Apple said the large commercial houses had made a success of it. Recently, the Subway in Philadelphia has been opened, and the large department stores have vied with each other as to who should give most to the public to get them in their places of business—for they consider that half the battle is won, if they can get people to cross the threshold of their doors. He favored accommodating the public in the way of postage stamps and post cards, for the pharmacist is supported by the public, and not the public by him, and he felt that he was justified in putting them under obligation to deal with him, as long as he treated them fairly and squarely.

In response to a suggestion from Mr. Hynson as to his idea of the distinction between conducting a post-office station and offering these accommodations referred to to the public, Mr. Apple said he had refused such a station. He had gone to the trouble of getting a commission for a substation, but after thinking the matter over carefully, and considering the possible loss of customers through dissatisfaction at the post office patrons



demanding a great part of his time—if the Government was properly served—he asked to be relieved of the responsibility, and did not accept it. He thought it was a mistake to go this far in accommodating the public.

As to the pharmacist's taking his clerk into his confidence, Mr. Apple disapproved of this, until the clerk had proven himself worthy; and he could not do that in a day, a week, or even a year. He had seen repeated instances where men had violated that confidence by starting up a store on the next corner, and utilizing his former employer's formulas and his acquaintanceship to his own advantage. Unless he is placed under bond not to enter into competition with him within a certain radius, it is policy not to take him into your confidence to too great a degree, until he has shown himself worthy of it.

As to the question of remuneration, and its influence on help in the drug store, that depended on economic conditions. In prosperous times he had difficulty; but since the recent adverse conditions in the country, he had had no trouble in getting good help.

On the question of window displays, he thought the window was either an eyesore, or could be made the most valuable part of the store. Experience had taught him that the large manufacturing houses considered the value of a good window display, in a first-class location, to be very great—as worth a hundred dollars or more for a week's use. But he thought the pharmacist made a mistake to allow his window to be used for displaying a thing he would be ashamed of—for a class of advertising that a lady, for instance, could not look at; he should be ashamed to put anything in his window that his wife or mother or sister could not look at. This is not only a question of money, but a question of morals as well.

As to spices, unfortunately the large commercial houses have taken this trade from the druggist, because the druggist was too honest to manufacture and sell sophisticated things of this kind. He thought the average druggist had too much sense and honesty to want to sell that sort of trash.

The confidence of the public is, of course, a valuable asset, and the only way to get it is by square dealing from first to last. A fair deal and truthful assertions at all times will always win out.

Mr. Apple thought it was no longer a question as to the advantage of co-operation with the N. A. R. D.; that is no longer an experiment. The N. A. R. D. has taught the value of co-operation, and has shown the druggists their power, a thing they did not realize before. It has taught the pharmacists a lesson they will never forget.

As to the sale of patent medicines: When we get to this question we have to ask, what is a patent medicine, and how do they become such? Let us call a spade a spade, and give the devil his due. A great many of the so-called patent medicines to-day were introduced into households by the physicians, by ordering original-package remedies—like one of our

leading alkaline antiseptic preparations that has a label on the back saying it is good for all the ills flesh is heir to. When physicians recommend such remedies—and they are advertised as patent medicines because the formula is secret—advertising them to the public indirectly if not directly, how can they complain of the pharmacists when they sell them? The line of demarcation between patent and proprietary remedies is a very difficult one to define, and one that will perhaps never be settled satisfactorily.

The pharmacist as a citizen: He should always be a first-class citizen, and take upon himself any duty that devolves on him as a citizen. If he will do that, he will lift himself among his fellow men, and it will prove a good commercial asset to him besides.

Mr. Hynson said that he thought a resolution should be added here, and he wanted to offer the following:

*Resolved*, That it is the sense of this Section that the closest and most amicable relationship possible should exist between this Association and the N. A. R. D., and it is hoped that the delegation from this Association to the forthcoming Atlantic City meeting of the N. A. R. D. will use every effort in their power to bring about that result.

This resolution was seconded by Mr. Eliel and carried.

The Chair stated that Mr. Lyman F. Kebler had prepared a paper on "Prescription Nostrums," that bore somewhat on the ninth query proposed by Chairman Diner, on the sale of patent medicines, and he would ask him to present it at this time. Mr. Kebler did so, first stating that he had intended the paper for the Section on Practical Pharmacy and Dispensing, but that it might very well be read before this Section. He also said he had brought out the illustrations given in this paper to show how, since the passage of the Pure Food and Drugs Act, interested parties had gone to work to devise ways and means of evading the terms of the law. The paper here follows:

#### PREScription NOSTRUMS.

BY LYMAN F. KEBLER, PH. C., M. D.

*Chief of Division of Drugs, U. S. Dept. of Agriculture.*

Since the passage of the Food and Drugs Act of June 30, 1906, there has been prominently brought into vogue a scheme for promoting drug products which takes advantage of the credulity of the public. The scheme is not new, as will shortly be shown, but is an old ruse modernized so as to deceive the more enlightened public and evade the provisions of the above act. This law forbids the use of any statement, design or device, which is false or misleading in any particular on the label or package of any drug product manufactured in the District of Columbia or the United States Territories or any drug shipped into interstate commerce, but it does not forbid the publication of misrepresentations and fraudulent statements in newspapers or other mediums which may be employed for advertising

purposes. Unfortunately this opening is taken advantage of by many promoters of medicinal agents. The scheme under consideration consists essentially of the publication in newspapers of advertisements extolling the virtues of certain remedies in the treatment of specific diseases. The prescription or recipe for the remedy is published in the advertisement or furnished by the advertiser upon application without cost, the understanding being that it can readily be filled by any local druggist. The prescription, however, always contains at least one product bearing a unique coined name, the nature and composition of which is known only to the advertiser, the manufacturer, or the parties interested in furthering the sale of the remedy. As a result, the local druggist is either unable to compound the prescription or in doing so, he is compelled to use a product usually composed of simple well-known ingredients which must be obtained from the parties interested in promoting the sale of the remedy.

Many druggists have, undoubtedly, been presented with a prescription taken from an advertisement which called for one or more products which which were unfamiliar to them. In fact no reference to same could be found in any available literature. While this scheme is known to many druggists, undoubtedly very little attention has been given to same until it appeared in its modernized form. In order to appreciate the underlying principle it will be necessary to give a short résumé of the scheme.

As early as 1859 the Druggist's Circular published \* the following information relative to a fictitious Reverend Edward A. Wilson and a questionable "Extract Blodgetti."

"We have had a number of inquiries about the same matter, and have tried to find out the Rev. Edward A. Wilson at Williamsburgh, but without success. We consider both him and the extract of blodgetti an unmitigated humbug."

In this case the preparation is advertised as a consumption cure and the prescription either published in the advertising literature or forwarded on request. The following is a copy of the prescription :

Extract blodgetti.....	3	ounces.
Hypophosphites of lime and soda .....	$\frac{1}{2}$	ounce.
Atlantin (pura).....	1	drachm.
Meconin (pura) .....	$\frac{1}{2}$	scruple.
Extract cinchona.....	2	drachms.
Powd. sugar.....	1	pound.
Pure port wine, rum or whiskey.....	$\frac{1}{2}$	pint.
Cold water .....	1	quart.

It is not considered desirable to burden this paper materially with the information published in the past relative to the mysterious "Extract Blodgetti" but any one interested in this product will find very entertain-

---

\* Drug. Circ., 3, p. 229 (1859).

ing reading in the following references of the Druggists' Circular,\* under such titles as: "Cure for Consumption," "The Extract of Blodgetti," "Recipe for Catarrh, Consumption, Asthma, etc."

The individual behind this scheme during recent years was a Mr. C. A. Abbott. The attention of the postal authorities was called to the Wilson preparation and on investigation it was found that there is not now, nor has there ever been a Reverend Edward A. Wilson connected with the remedy. In fact, no Reverend gentleman whatever has been connected with the scheme. Mr. Abbott himself does not possess any medical or pharmaceutical knowledge of any character. It was furthermore admitted by Mr. Abbott that the representations made in the advertising literature with regard to Wilson Preparation of Hypophosphites and Blodgetti in the treatment of consumption were false and misleading in every respect, and in compounding the prescription no such ingredient as Extract of Blodgetti was used. This name was used in the prescription solely for the purpose of making it impossible for the average druggist to fill same, thereby compelling the patient to have it filled by the advertiser at an exorbitant price. It seems unnecessary to say that the Postmaster-General issued a fraud order on the ground that the business was a scheme for obtaining money through the mails by means of false and fraudulent representations and promises. It should be carefully noted that a fraud order was issued because money was obtained through the mails because of certain false and fraudulent pretenses and promises. By this is meant that the remedy itself, accompanied with or without false and fraudulent pretenses and statements, is sent through the mails or that money is obtained by means of money orders, postal orders, etc. Jurisdiction does not extend to misrepresentations and false statements appearing in newspapers, magazines, periodicals, etc., per se.

The Arabian Sea Grass preparations will probably be recalled by some in business 20 or 25 years ago. An interesting editorial relative to this preparation appeared in the Druggists' Circular,† and is herewith quoted to show the conditions then existing.

"TWO FREE RECIPE SWINDLES.

"The two recipes which follow have been previously published in this journal, and their fraudulent nature exposed, but as every month brings fresh inquiries in relation to them from those of our subscribers who do not have access to the back volumes of this journal, we have concluded to give these two frauds the benefit of a little more free advertising. The first is the well-known 'Le Grande's Arabian Recipe for the Cure of Catarrh, Bronchitis, Hay Fever, and all Diseases of the Mucous Membrane.'

\* Drug. Circ., 6, p. 168, (1862); Drug. Circ., 13, p. 58, (1869); Drug. Circ., 19, pp. 207, 238, 261 (1885); Drug. Circ., 33, p. 65, (1889).

† Drug. Circ., 29, p. 75 (1885).

EXTERNAL REMEDY FOR NASAL DOUCHE.

R. Pulv. Arabian sea grass.....	1	ounce.
Pulv. Arabian kanke root.....	5	drachms.
Chlorate quinia.....	1	drachm.
Acetate silica.....	5	drachms.
Soda sulph. ....	1	drachm.
Magnesia sulph.....	1	drachm.
Glycerin .....	2	ounces.
Aqua picis .....	q. s.	fiat O;

INTERNAL REMEDY.

R. Ext. Arabian calla root.....	1½	ounces.
Comp. tinct. Arabian red lava flower.....	2	ounces.
Ferro-citrate calcium .....	1	drachm.
Bisulphate quinea.....	4	drachms.
Potassa iodide.....	1	drachm.
Phospho salicylate .....	1	drachm.
Glycerin. ....	2	drachms.
Verium ferri.....	q. s.	fiat. O;

"Dose, one tablespoonful four times a day before meals and before going to bed.

"The following, of the substances named above, are fabrications of the 'Dr. J. A. Lawrence,' of Brooklyn, N. Y., and have no real existence: Arabian sea grass, Arabian kanke root, acetate silica, Arabian calla root, Arabian red lava flower, phospho salicylate, verium ferri. Chlorate of quinia is a positive salt, but is not quoted by wholesale manufacturers of quinine salts. Ferro citrate of calcium represents no definite compound. It thus appears that nine out of the sixteen substances either do not exist or are not articles of commerce. The trap is so evident that no druggist need fail to see it, but we have no doubt that many persons are influenced to send the 'doctor' \$3 for the medicines.

Comment on the above is unnecessary.

A similar scheme under the designation Dr. Stevens East India Consumption Cure was foisted upon the public several years ago. The following is a sample of the advertisements used in newspapers.

"CONSUMPTION.

An old physician, retired from business, had placed in his hands by an East India Missionary the formula of a simple vegetable remedy for the speedy and permanent relief of *Consumption, bronchitis, catarrh, asthma*, and all Throat and Lung Affections; also a positive and radical cure for *nervous debility* and all Nervous Complaints. Having tested its wonderful *curative* powers in thousands of cases, and desiring to relieve human suffering, I will send *free of charge* to all who wish it, this recipe, with full directions for preparing and using. Sent by mail, by addressing, with stamp, naming this paper, W. A. Noyes, 847 Powers Block, Rochester, N. Y."

As in the case of the Wilson remedy the patient, upon replying to the advertisement, received printed matter setting forth a prescription, testimonials, and a story telling how "Dr. Stevens" who, in 1866 was afflicted with consumption, was cured through the agency of the "Sativa remedy" which he received from the hands of an aged missionary who had spent many years in India and other countries of the East, and who had given

the recipe to his successor, W. A. Noyes, the present owner of the business with the admonition to carry on the work of making the remedy known to the afflicted as long as possible.

The prescription follows :

Extract Asiatic cannabis sativa.....	2	ounces.
Extract Asiatic halish sativa.....	3	ounces.
Verbena hastata .....	2	drachms.
Extract diosma .....	3	drachms.
Pulv. cinchona bark.....	2	ounces.
Ex. cashgar leaves.....	3	ounces.
Inulin .....	1	drachm.
Loaf sugar .....	1	pound.
Rum or gin .....		$\frac{1}{2}$ pint.
Water .....	1	$\frac{1}{2}$ pints.

For the speedy and permanent cure of Consumption, Asthma, Catarrh, Bronchitis, and all Throat and Lung affections; also a positive specific and radical cure for Nervous Debility, and all nervous derangements and disorders.

The two unknown substances in this prescription are extract diosma and extract cashgar leaves. The former meant extract of buchu and the latter extract of blood root.

It was found on investigation by the Post Office Department that there was not at the time of the investigation nor had there ever been a Dr. Stevens or a missionary connected with the scheme. It was furthermore found that the United States mails were being used in violation of the postal laws and a fraud order was accordingly issued. Other individuals utilized this same scheme, but the above are sufficient to show its virtues.

It was clearly evident that a scheme of this character, where numerous false and misleading statements appear upon or accompany the package, could not be continued after the enforcement of the Pure Food and Drugs Act. The law was, accordingly, carefully studied with a view of finding some way by means of which the scheme could not only be utilized, but utilized to advantage in the promotion of certain remedies. The scheme finally evolved was that false and misleading representations, statements and promises should appear in newspapers in the form of "reading advertisements." The advertisement usually contained a prescription, the filling of which required several well-known efficacious remedies, together with a fancy name product. The prospective patient was advised that the prescription could be filled by any druggist. The druggist, therefore, is made a party to the scheme. In order to render the scheme more effective it was found desirable to place the advertisements in papers in such a manner as to make them appear either as editorials or general reading matter. As can readily be seen this required the acquiescence and co-operation of those interested in the management of newspapers. On inquiry it was found that newspaper managers require an increased rate in placing these adver-

tisements, double the regular price being the customary charge. From the large amount of advertising and the number of these remedies, this scheme has apparently been very attractive, not only to the newspapers, but to the promoters of these remedies as well. The earlier mail order remedies were intended for the ignorant classes, but the modernized scheme is for the benefit of the better educated and that it does appeal to this class is shown by the fact that requests for information concerning the same come from lawyers, Congressmen, doctors, etc.

In the interest of humanity and for the benefit of my readers, copies of two choice advertisements are given.

#### "AN EDITOR'S ADVICE TO RHEUMATICS.

"It is truly said that the 'Lord tempers the wind to the shorn lamb,' and he also seems to send for every ill a remedy. Modern science has done much to develop these remedies, yet sufferers from rheumatism occasionally find it hard to believe that there exists any positive relief for their distress. Nevertheless, we are in a position to recommend to our readers who suffer from rheumatism or kidney or bladder trouble or any derangement of the urinary organs, an unfailing relief for their pains. This, we know, will be all the more welcome news because the remedy is easily produced.

"Go ask your druggist for one-half ounce aromatic fluidextract cascara, one ounce of concentrated ——— compound, and four ounces of aromatic elixir. The ——— compound is put up only in one ounce bottles, so be sure you get the right article. Take these three things home, put them in a bottle, mix them, and take one teaspoonful after each meal and at bed time. For children, from one-third to one-fourth of this dose will be enough. In order to make a permanent cure doubly certain it is best to continue taking the remedy for several days after all pain and swelling have disappeared. You will then be as free from pain as if you had never known what rheumatism was."

#### "FAT-DEFEATING EXTRAORDINARY.

"Slender Margaret Knolly, now, if you please. The fascinating leading lady of the Bijou, now more fascinating than ever, astonished all her friends on Broadway the other day by presenting to their admiring gaze a svelt and willowy form in place of the plump, not to say fat, outlines with which she gayly sailed away to new triumphs and foreign shores last January. After a good deal of diplomatic cross-examination from interested fat acquaintances the secret was cautiously whispered to a few dear friends with the result that everybody knows it now. It was not exercise, nor fasting, nor sea air, nor worry about her new venture that had brought about this wonderful willowy change in the charming Margaret; no, none of these; nothing but a simple mixture which all good druggists are familiar with and can supply at a small cost, to wit: One-half ounce ———, one-half ounce aromatic fluidextract cascara, and three and one-half ounces of simple syrup. 'Grown folks need a teaspoonful after meals and at bedtime,' explained the now slender Margaret. 'It is simply wonderful. It takes off the fat quickly as much as a pound a day, and keeps it off. You can eat what you like, too. In that respect it is unlike anything of the kind I ever heard of, and besides it has another splendid feature, it is entirely harmless, and will not cause wrinkles. I think it is about as essential a toilet article for the woman who is fat and wants to get thinner as face powder. In order to get the best results, however, you should buy the ——— in the original package and mix it in with the other two ingredients after you get home.'"

The last sentence of the latter advertisement must certainly be a Job's comforter to every honest druggist.

Investigation shows that there have been launched since the passage of the Federal law about 40 of these prescription nostrums. As a rule, they are composed of very simple ingredients, well-known to the average druggist and doctor, and yet are lauded as possessing miraculous properties. The drugs added by the pharmacist in most cases constitute the best part of the remedy. The price charged is exorbitant to a degree. This is admitted even by the promoters but the contention is made that it is necessary to charge a high price because of the extensive and expensive advertising necessary to bring the remedies to the attention of the public. The men back of these schemes are usually now or have been connected with some advertising agency or have acted in the capacity of advertising agent of some newspaper. They have no knowledge of medicine and claim none is needed because the large pharmaceutical manufacturers are prepared not only to supply the medicine but the medical data as well. The afflictions usually aimed at for treatment by these remedies are those affecting the lungs, stomach, liver, kidneys and heart.

Mr. Osseward, commenting on the paper, said this was a very interesting topic, and that he had had considerable experience in Seattle in that direction, that, at one time, most, but not all, of the wholesalers there had run out of dandelion, and had made an extract of dandelion, or extract of sarsaparilla, in a way to resemble the real product. This was not right, of course, and he had refused to dispense it. As to "kargon compound," he said he would tell his customers it was a fake; but they insisted on having it, and he could not get it fast enough. People would come to his place and get that stuff, because the public knew they would get what they asked for. If the public know they will get what they ask for, the pharmacist will have no trouble in getting the prescription business.

Mr. Ladish, of Chicago, said that in Massachusetts they had passed a law requiring that all patent medicine advertisements of a character to mislead the public must be headed in bold type, "This is an advertisement." This had killed the demand for "kargon compound" very quickly, and there was no longer any demand for it. He thought if this Section or the N. A. R. D. would "get busy" in this matter, and secure the enactment of a general law of this character, this evil would soon be abolished.

Mr. Eliel thought that the right spot had just been touched as to the place where our work should be begun to stop the sale of these fraudulent preparations with which the country is being flooded. In order to make the Pure Food Law more effective, and to carry out the principles for which it was established, it is necessary that some legislation be obtained by which the public may be protected against this class of preparations. In his opinion Congress should so regulate the matter as to shut out of the



mails all newspapers carrying misleading advertisements. He had made some recommendations along that line at the meeting in New York last year, in his address as President, and thought his recommendations were referred to the Section on Education and Legislation, and if it had taken no steps in that matter it had been negligent of a duty. It was high time steps were being taken to protect the public from fraudulent preparations, such as those mentioned in the paper of Mr. Kebler, and he hoped this Section would, before adjournment, put itself on record as being in hearty sympathy with this movement, and do what it could towards getting the proper legislation on our national statute books.

Thereupon, Mr. Hynson moved the appointment of a committee of three, to prepare this proposition in its best form, and present it to such associations of newspaper men and editors as might be found expedient.

The Chair suggested that the whole matter had best be referred to the Section on Education and Legislation, that being the Section best equipped to handle any topic referring to Legislation.

Mr. Hynson said he meant that this Section should represent the views of the American Pharmaceutical Association on this particular subject; and, following the suggestion of the Chair that the Association in general session would have to ratify any action of this Section, he amended his motion to this effect: That a committee of three be appointed by the Chair to consider this subject of patent-medicine advertising, and present it to the Association in general session, with the recommendation that the committee be empowered to transmit the views of the Association on this subject to such editorial associations, or other associations of newspaper men, as it may elect.

This motion had a second in Mr. Eberle.

Mr. Bowman, of Toledo, said the Section should remember that, in making a law to cover this particular subject, it would probably apply and extend to everything else along commercial lines: that you cannot legislate against these things in the pharmaceutical line, and at the same time guard against its being used in other lines.

Mr. Ladish suggested that the Massachusetts law had already done this very thing.

The Chair said that the motion of Mr. Hynson, as he understood it, simply involved an expression of opinion to be made to the newspaper editors of the country that they should no longer publish such advertisements. Mr. Hynson said this view was correct.

Mr. Ladish moved that the Chair appoint a committee to confer with the Section on Education and Legislation in regard to drafting a model bill, to be patterned somewhat on the Massachusetts law, and in that way cover the entire ground thoroughly.

The Chair suggested that this motion be retained in essence, but changed to this extent; That this Section recommend to the Section on Education

and Legislation that it draft such a model bill—because that Section has the officers and machinery to draft the bill.

Mr. Hynson said this was acceptable to him.

The Chair then so put the vote, that the Section on Education and Legislation draft such a bill, patterned somewhat after the Massachusetts law, to prevent by legal measures such advertisements "as we all have in mind," and it carried.

The Chair asked Mr. Hynson if it was his idea, as to his resolution, that the Chairman of the Section on Education and Legislation should appoint this committee, or that it should be done in general session, by the President of the Association. Mr. Hynson replied that he thought the Chairman of this Section should appoint this committee of three, to draw up resolutions to be read Saturday morning, before the last general session: that this was not a matter of legislation, but one of sentiment of the Association.

And it was so understood.

Mr. Apple, recurring to Mr. Kebler's paper, and his remarks on the cocaine question, said he thought some of the members might have misconstrued Mr. Kebler to mean that it was legal to send cocaine through the mails, as he said the law did not cover this substance; but he thought there was a law on the statute books, recently passed, which debarred cocaine absolutely from the mails, or any compound containing it.

Mr. Kebler said that what he wanted to say was, that cocaine could not be sent through the mails irrespective of what representations were made concerning it. If these products are sent through the mails, marked with false or misleading statements, a fraud order can be issued. Cocaine cannot be sent through the mails at all; that is forbidden absolutely. But the Postmaster-General cannot issue a fraud order against this, because there is no provision on the Appropriation Act which entitles him to do that. Continuing, he said that the department was investigating all these products, and hoped to publish results shortly.

The Chair here announced the appointment of the following committee of three under the Hynson resolution, to draft resolutions to be presented at the last general session on Saturday morning: Messrs. H. P. Hynson, C. Osseward and E. H. Ladish.

The Chair made the rather desultory course of procedure before the Section this afternoon his excuse for adverting to the question of spices, and remarked the presence of Mr. Henry Kraemer, of Philadelphia, who had given a great deal of attention to spices in the last few years, and could no doubt give a lot of information on that subject. He thereupon invited the gentleman to address the members along this line.

Mr. Kraemer began by expressing his appreciation of the compliment of being called on to say a few words on the subject of spices. He was sure the commercial men were under a great deal of misapprehension in

regard to the object of the teaching in this department of work. It might seem to them sometimes as if pharmacognosy was purely an ethical subject, and had no practical bearing on their work ; but as a matter of fact, as he would show to-morrow in the Section on Education and Legislation the druggist knows a great deal more *about* drugs than he knows *of* them. What the pharmacist wants to know is, whether this is ginger and that pepper. He could show very easily to those unfamiliar with analytic work how important it is to test the articles that the pharmacist handles.

Mr. Kraemer said he did not desire to make the impression that it was impossible to buy good drugs at the present time, for there never was a time when such goods could not be obtained ; but it was also true that there never was a time when adulteration was more skilfully done, and it especially behooved the retail druggist to be able to back up his goods with a guaranty based on his own testing of them, in view of the fact that the law makes him really responsible for their character.

He regretted that he did not have specimens of ground spices and a microscope with him, that he might demonstrate to the members how easily these adulterations could be detected.

Mr. Hynson asked Mr. Kraemer if he would advise druggists to handle spices, and he replied in the affirmative, and added that the same thing would apply to flavoring extracts ; extract of vanilla and lemon, for instance, should be the product only of such skill as the pharmacist alone possesses. The grocers have supplied these things under guaranty, and the trouble is that the pharmacists have not been able to test them for inferiority—although, as a matter of fact, better specimens can sometimes be had from the grocers than from pharmacists who are not careful. This is a trade that properly belongs to the druggist, and is much more remunerative than that of many things he handles.

Continuing, Mr. Kraemer said that he would be glad at some future time to arrange an exhibit of specimens belonging to his own department of work, and expressed the desire to know some of the problems which confronted the members of the Commercial Section in order that he might answer them. Many of these problems the teachers do not consider because they think they are known.

He stated that the Branches were the proper place for demonstrations and discussions along this line, and expressed the hope that all the Branches would take up the work of educating the retail pharmacist, because he is the man that must be reached in the development of pharmacy, so as to conform to the provisions of the Pure Food and Drugs Act ; through him closer relations with the physicians are to be brought about, and through him must other problems of the day be solved.

The Chair said the remarks of Mr. Kraemer were very interesting, and he thought the Section would be equally interested in hearing from Mr. Lucius E. Sayre, of Kansas, on the same subject.

Mr. Sayre said he had been very much interested in the remarks of Mr. Kraemer, but as he had gone over the subject of the microscopical examination of powdered drugs and spices he doubted whether he could add anything to what had been so well said. However, he would give the members the benefit of some personal experiences in regard to the examination of spices.

Some years ago, he said, when he was engaged in the manufacturing business, it was necessary for him to have two barrels of ginger. He went to a miller who was supposed to be able to give him just what he wanted. He said to him he would like to have two barrels of pure ginger—ground ginger. "We haven't got it in stock," was his response. "Well, can't you grind it?" "Our mills are not adjusted to grinding pure spices." "What do you mean, then by having on your shelves here 'Perfectly pure ginger?'—so labeled. You also have another brand, 'Strictly pure ginger,' and another labeled 'Grocery pure.' What does that mean?" "These are simply commercial brands: they are not as represented. They are not pure, but simply *brands* of ginger." It was strange, but nevertheless true, Mr. Sayre said, that he was unable to get two barrels of pure ginger at that time.

Last winter he had an interesting experience in analysis of a sample of ginger that he reported to the Board, stating that it was adulterated—and also a specimen of pepper that was adulterated. He got a letter from the manufacturers stating that they had seen this report, and that they had lost a considerable amount of their trade in consequence; that they had written to the secretary of the State Board that their competitors were using the information so given out against them, and they had lost something like a hundred thousand dollars in trade thereby, and intimated that there was a possibility of a suit. He replied that they stood by their examination, and invited the manufacturer to send his chemist and microscopist to test the truth of their analysis from some of the original material still on hand, the University to pay the cost of the examination if the analysis was not correct, the manufacturer to pay if it was. The reply was that they had never purchased and had never ground anything but absolutely pure spices. The question was, whether the Board were correct in their analysis or not. The manufacturer did not deny that the analysis was correct, but contented himself with saying that he had never ground anything but pure spices.

Where the adulteration came in Mr. Sayre did not know, but he did know that the miller's spices are used by intermediate parties sometimes as a means of mixing and making compounds which they sell, and that the adulteration comes in between the manufacturer and the consumer in very many cases.

The young student of pharmacy should be educated in the microscopic analysis of powdered drugs, and in his own institution and some others

that is being done with good results. But he should be first prepared for this by acquiring some knowledge of the elements of 'botany, so that he may identify the microscopic constituents or elements in these powdered drugs. It is very discouraging to have such suggestions denounced as "poppy-cock," and to find that the state boards omit all purely botanical questions, thus leading students to object to the taking of the necessary time for the study of botany ; but, on the other hand, it is encouraging to find practical pharmacists once in a while who are capable of making these analyses. He illustrated by citing an instance of a druggist in a small town of five hundred inhabitants, whose analysis of a sample of iodide of potassium, showing it to be grossly adulterated, had greatly incensed the wholesaler, but which proved correct, nevertheless, on original analysis by the speaker.

These incidents related by Mr. Sayre reminded Mr. Whelpley of an experience he had had some years ago, before the days of the Pure Food Laws, when a spice-dealer came to him with a sample of a spice "filler," and said he suspected that the filler, offered him at a ridiculously low price, was *adulterated*, and he wanted to know whether such was the case.

Another experience was, that not long ago, he was visited by the representative of a spice manufacturer—a manufacturer of *pure* (?) spices—who brought with him a sample of a spice already examined by the government and the article admitted. This party wanted to know what the charge would be to give him an opinion as to whether the government chemist could actually discover a certain adulterant in the powdered drug !

As to Board of Pharmacy examinations, he had prepared and submitted a few years ago a sample set of examination questions, including two or three questions in microscopy, and had received letters from several Boards saying they could not think of asking such questions. One question was, "What is a microscope?" and they could not even ask that. One man said if he knew what a microscope was he would not have enough money to buy it. Conditions are changing for the better, though, Mr. Whelpley said ; and while he had not noticed any questions in microscopic technology, he found an increasing number of questions in microscopic botany.

Mr. Apple thought the real meat of this question, so far as this Section was concerned, was in the practical application of all this knowledge, and that suggestions how to use this knowledge commercially were in order—in other words, to make the drug business pay better. He believed it would be an admirable idea to endeavor to get back this spice trade ; but to do it honestly ; and the only way it could be gotten back honestly would be by making these microscopic examinations of spices, advertising them as having been personally so inspected, hence justifying the claim of superiority for them, thus appealing to the public because they have been so personally inspected and tested, and depending on that confidence of the public that

has been built up by fair and square dealings in the past. He believed it would be a good commercial asset to do that, so the pharmacist could honestly state he had tested these things microscopically, and therefore could guarantee the quality.

Mr. Hallberg, continuing this discussion on the subject of spices, said he could contribute nothing to the pharmacognosy side of the question, but would relate an incident to show the value of honesty and fair dealing in such matters. He said a few days before he left Chicago there appeared in his office a man he had not seen for many years. This man had started a drug business in a little town in Illinois, and had begun by buying several barrels of the purest, ground black pepper. He had ten thousand little envelopes printed, with something like this statement on them: "This ground black pepper is absolutely pure. If you doubt it, try it and test it; and if you want any more like it, call on," etc. He distributed these ten thousand envelopes in his town and the surrounding country. After a while the people began to come there for their pepper. Then he took ginger, and kept on until he had all the trade of that section on spices and a great deal of the other trade besides.

The Chair stated that the journal with which he was connected about a year ago had a symposium on the subject of spices, and the almost universal opinion was held that the best way to build up a trade in spices was to sample them, and when a customer asked for one spice to give him a sample of another also. He related the very satisfactory experience of ex-President John F. Patton in building up a trade in black pepper. He buys the pepper whole, in order to be sure he is getting a pure product, and also to be sure it has not undergone any depreciation in strength, and then he grinds it in granulated form, the idea being that the granulated pepper is better than the powdered pepper. He puts it up in small wooden boxes, and these are distributed to the farmers and others in his vicinity, and he gets a good price for his pepper.

A manuscript copy of certain abstracts on National Formulary propaganda, prepared by Chairman Diehl of the Formulary Committee, and which he said was simply a collection of crude abstracts made from time to time without any attempt at systematic arrangement, was, on motion of Mr. Hynson, referred to a committee of three, to be appointed by the Chair to study this matter and report to the Committee on Publication their views as to whether it should be published in the Proceedings.

The Chair appointed as such committee Messrs. M. I. Wilbert, E. H. Ladish, and A. F. Sala.

Mr. Mittelbach called attention to the fact that a committee on the Parcels-Post Bill before Congress had been appointed at the New York meeting last year, and suggested the presence of the chairman of that committee, Mr. Kniseley. That gentleman, however, asked for further time, that he might confer with his associates on the committee as to certain

matters before making report, and the matter was passed to the next session.

Mr. Kebler, adverting to Mr. Kraemer's remarks on spices and their adulteration, said the Government had not gone into the drug-stores as yet in making its investigations, but with the information submitted it would do so—ascertaining first, of course, whether the products were shipped as interstate commerce. They had made a number of such examinations, but he did not know whether they were druggists' samples or not. He related the incident of going through a large warehouse in a certain city, where he discovered some bags of imported spice filler that had gotten through the Custom-house, and inquiry elicited the candid statement that, while it could not be used for interstate commerce, it was proposed to use it in the State of Maryland.

A paper by J. W. McCorkle on the management of a retail drug-store was passed, in the absence of the author.

The text of the paper here follows :

#### THE MANAGEMENT OF A RETAIL DRUG STORE.

BY J. W. MCCORKLE.

*Mr. President and Members of American Pharmaceutical Association:*

I want to commend your Committee on Papers and Queries, not for their selection of parties asked to prepare same, but for their method of inducing those asked to respond.

Some time during the early spring when the violets were in bloom and their fragrance wafted broadcast by our southern breeze, visions of soda boys with white jackets, tables surrounded by pretty girls, buggies and carriages around the front, and the cash register keeping time to the music, I received a polite request to prepare a short paper to be presented to this meeting on "How to Conduct ; or, The Management of a Retail Drug Store." My attention was called to the fact that I had until the first of September to get the paper up, and as most of us retail druggists "never do things to-day that can be put off until to-morrow," imagine my feelings upon opening my mail on the morning of July 18th and reading the following card :

DEAR MR. MCCORKLE:

Kindly send me at once your paper entitled "The Management of a Retail Drug Store." I am compelled to have my program in readiness by the 25th inst. Your paper may more properly come under the Commercial Section, hence I am very anxious to read it.

Yours fraternally,

FRANK M. APPLE.

By way of parenthesis, I will say upon receipt of this card, the thermometer registered from 95° to 100° F. under the awning in front of my store ; however, bespeaking for myself that charity characteristic of our

profession, I herewith submit a few thoughts and ideas obtained from an experience gotten from a \$12.50 per month job in a country drug store, to the proprietorship of what is regarded the largest and best equipped store in Mississippi.

One of the first essentials to the successful management of anything is a knowledge of the business. This is especially true with regard to the retail drug business. One of the greatest and most productive causes of so many failures is due to a lack of knowledge of the details of a retail drug store—depending upon hired help to do things we should do ourselves. This knowledge is best obtained by an early training under a competent, conscientious retail druggist, and at the proper age and conditions, enter one of our best colleges of pharmacy and graduate therefrom. Thus equipped, with sufficient cash to buy a well-selected stock of drugs and drug sundries, a location selected with care, there is no reason for failure, if conducted properly.

In the management of a retail drug store the nature of the business develops careful, painstaking habits, and this is one of the features that distinguish between the professional and commercial, placing our business above the plane of "selling and getting gain" or, "for revenue only," and justly entitles it to be called a profession.

There are so many things to be said or written about the retail drug business, that in a short paper, I can only mention a few which I consider the most important, and as your committee tells me my paper will come before the Commercial Section, will speak mainly from that standpoint. A system of book-keeping, showing a complete and honest record of all purchases, sales, cash, merchandise and expense accounts, annual inventories, in other words, a system that can give you within a few moments a complete status of the business, is indispensable.

The buying of goods is one of the most important features ; concentration of purchases to a few good houses is better than buying from everybody that comes along. Be friendly with and buy from the drummers. Ninety per cent. of my purchases are through them ; I have almost forgotten how to write a mail order. They stand between the retailer and jobber, and in cases of misunderstandings and errors they will take a stand for the retailer, he represents his stock in trade. Pay your bills promptly, and if there is anything good to be had, you will get it.

I do not think it wise to buy anything in excess, or overstock, but in sufficient quantities to supply the trade. The getting of prices is of course very important. I had rather be known as a "high-priced druggist" than a "cheap one," especially as to prescriptions ; of course the price of patents, since the Indiana decisions, vary in almost every locality, but I have always asked and insisted on getting the best price possible for everything sold over the counter.

The treatment of employees is very important ; cheap clerks are high at



any price. Pay good wages, pay promptly (my plan is to pay soda boys weekly and the other force every ten days). Never ask an employee to do any thing you would not do yourself, nor work longer hours. Invite their coöperation and advice and be social with them. Demand good service, and whenever an employee expresses a desire to quit, relieve him at once, if you are compelled to do his work.

The treatment of customers is an item of great importance, as it has been well said "a satisfied customer is the best advertisement." People enter drug stores for something—either to buy or to get information—always see to it that they go out with a feeling of having gotten what they came for. Holding old customers frequently means more than getting new ones.

If your store has the patronage of physicians, and most of us have, it requires good generalship to "keep peace in the family." Doctors are drug-store necessities, but cannot be allowed to consume all of the profits. One of the most intelligent and reputable of all professions, as a rule they have a high regard for the rights of others, and if their privileges are abused, usually it is the fault of the druggist.

No druggist should conduct a store without two or three of our best drug journals, and we have them as good as the world affords, nor can he afford not to affiliate with his county, state and national drug associations.

The drug sundries and side lines are of special importance. In my store I have a sub-postoffice, street-car waiting room, sell express money orders, and daily receive money for half-dozen orders. Push every side line in keeping with the dignity of a first-class store, and you will find all of these things helpful to trade.

Last but not least is the collection of bills. Instead of collecting on the first of the month, my collector is out nearly all the time seeing customers that ask him to "call later." Slackness along this line is suicidal.

In concluding this short paper, I want to impress this idea upon my brother druggists, that the store which carries the best stock and gives the best service is the store that will succeed. "Eternal vigilance" is the price we are called upon to pay.

I thank your committee for the honor conferred upon me and for your attention.

Mr. Hallberg called attention to a transposition of the name of Section officers in the "Bulletin" by mistake of the printer; and, referring to the McCorkle paper, questioned whether the paper should be accepted, as the author was not a member of the Association. He did not press the matter, however, upon the suggestion of Mr. Hynson that this was a question for the Council.

Mr. Hynson suggested to the Chair that his own paper on the subject of some of the common errors in business accounts had not been presented, and Mr. Mason read his paper as follows:

## SOME COMMON ERRORS IN BUSINESS ACCOUNTING.

BY HARRY B. MASON.

As a pharmaceutical editor I have given a good deal of attention during the last three or four years to the subject of business accounting, and have examined and discussed the annual statements of dozens of pharmacists scattered throughout the country. I am glad to say that druggists are gradually waking up to the cardinal necessity of keeping business records in order that they may actually know the facts regarding their profits and earnings, and I may add that many of them have found they were losing money on certain sales which they formerly thought yielded them a profit. Knowledge of this kind is certainly power. It points out the way of correction. It indicates the road to success.

But while more and more druggists are taking up with business accounting, and while this augurs well in itself for the commercial future of the calling, a considerable number of pharmacists, I have discovered, fall into errors which with greater or less seriousness disturb the accuracy and value of their findings. Let me touch briefly upon a few of these.

The first and most important essential in any system of business accounting is of course the annual inventory, but since I dwelt upon this phase of the subject at considerable length in a paper read before the section last year,\* I do not feel like trespassing further upon your attention. It may be said, however, that business records which do not include careful inventory figures are exceedingly unreliable, and may easily be so inaccurate as to lead one far astray. A druggist may believe his percentage of gross profit to be 40 when in fact it is only 30, and he may consequently be losing money on many transactions which he foolishly fancies are yielding him good returns. I am glad to say that an increasing number of druggists are taking stock every year, although it must be added that there is still considerable room for improvement.

Many pharmacists who take inventories annually, however, fail to write off anything for depreciation in stock, fixtures and book accounts. That this omission seriously affects the figures as to profits and real earnings is patent on the surface. A soda fountain, for instance, undergoes a rapid decrease in value from year to year. With shelving and show-cases the depreciation is less marked. With stock it is a smaller consideration yet—that is, if the druggist keeps his stock moving, as he ought to do. To keep on valuing all these things every year at their original cost is simply to deceive oneself as to the extent of his profits—and is self-deception of the most short-sighted and foolish kind. Wise druggists annually “write off” 10 per cent. on their soda fountain and at least 5 per cent. on their fixtures.

A similar depreciation really takes place in the value of the book ac-

---

\* See page 519 A. Ph. A. proceedings for 1907, vol. 55

counts. Some of them cannot be collected, and to have them represented in the assets at their face value is to practice a method which no good business man would tolerate for an instant.

On making calculations at the end of the year's business it is customary first to subtract from the purchases any increase found in the stock, or add to them any decrease, thus arriving at the cost of goods actually sold during the year. The amount so obtained is then deducted from the sales to get the gross profits, and from the gross profits are in turn deducted the expenses in order to get the net profits. The net profits so obtained, however, are only apparent net profits, and before one can get at the real facts he must deduct the amount of depreciation in stock, fixtures and book accounts. He has then arrived at the actual net profits of his business, and is no longer deceiving himself as to the facts.

A form of statement which lends itself to this method of calculation may not be without suggestion :

Total sales.	Purchases.	Stock increase or decrease (inventory.)	Cost of goods sold.	Gross profits.	Expenses.	Apparent net profits.	Depreciation in fixtures.	Depreciation in accounts.	Total depreciation.	Actual net profits.	Inventory stock.	Inventory fixtures.

The druggist who is able to fill out an annual statement of this kind in detail is in possession of the actual facts regarding his business—facts which he ought not to be without for a single instant if he desires to succeed in this day of ever-increasing competition and ever-developing attention to the science of commerce.

To the columns indicated in the diagram one might add another for the proprietor's total income from the business—this being obtained by adding the actual net profits to the proprietor's salary already represented in the list of expenses. Still other columns might, if desired, be used for recording the percentage of expense and the percentage of gross profit: these percentages, whether included in the annual statement or not, are of vital importance, and accurate knowledge of them is perhaps the greatest advantage flowing from any system of business accounting. They bear upon every sale made during the year; they have an important connection with the price established on every article; they tell the merchant at once whether he is really making or losing money; they furnish him with information which enables him to conduct his business intelligently and profitably.

But of course such records as I have indicated in the form of statement submitted above should be accurately kept if they are to be of value—that goes without saying. I have found that druggists are likely to err in two or three particulars.

Many of them, for instance, charge freight and drayage against expense, whereas they should be charged against merchandise—they are properly a part of the cost of the goods. In either case the net profits are the same, but the items of gross profit and percentage expense are somewhat modified, and it is needful that these factors should be estimated correctly for obvious reasons.

Then, again, some pharmacists fail to include a salary for themselves among the expenses, and under such circumstances the findings are not only misleading, but contrary to all reason and good business practice. A proprietor should at least charge up against himself a salary equivalent to that which he would be compelled to pay a manager in case he could not give his personal attention to the business, and he should do this even though, as sometimes happens, he lives off outside investments and draws nothing from the store for private expenses. If he fails to do so he is deceiving himself regarding the returns. His apparent percentage expense is far lower than the facts justify, and many sales which he blindly fancies are yielding him a profit are in reality contributing little or nothing toward his own maintenance. Every pharmacist ought to get, and practically every one has to receive, his living from his business, and an article or line of articles which does not at least pay the proper percentage toward this end should be under serious suspicion.

Many druggists, too, are careless about recording all their expenses. They will pay out small amounts for this and that expense and either forget or neglect to make the necessary charges. It is quite unnecessary to say that the careful merchant should be as particular to make entries of this kind as in making charges against his customers. If one is going to keep business records at all he should keep them accurately. Not long ago, for instance, I examined the statement of a pharmacist and found that, according to the man's own figures, \$457.79 had somewhere been lost in the shuffle during the year. There had doubtless been several leaks, but I suspected that a failure to record all expense payments accounted largely for the deficiency.

This brings us to the last point in my list of suggestions. The annual statement ought to be compared with the actual facts so far as they are ascertainable. If, for instance, a druggist's statement tells him, after all his calculations are made and deductions are drawn, that he has made a certain sum of money during the year, he should confirm the figures by comparing them with the amount of cash really drawn from the business or lying in the bank. If the pharmacist whose statement I have mentioned in the foregoing paragraph had gone to this trouble he would have

discovered that he actually made \$457.79 less than he imagined. This would have considerably modified his calculations regarding percentage of expense and percentage of gross profit, and to this extent would have enabled him to conduct his business more wisely and carefully.

The whole burden of this paper is to utter a caution against pulling the wool over one's own eyes. The man who deceives others is a knave. The man who deceives himself is a fool. Whether it is better in abstract morals to be a knave or a fool is a point on which practical philosophers have so far failed to agree. Society puts one in prison and the other in an insane asylum.

Mr. Hynson, referring to Mr. Mason's varied experience in practical affairs, asked him if he had not found this study of commercial law and business accounting a very interesting one, and he replied that he had found it quite fascinating.

Mr. Eliel detailed at some length his own experiences in the matter of accounts, and told how, by simply going over his books and taking his two principal accounts of merchandise and expenses, and striking an average for, say, three years, he could come very close to the actual conditions existing in his business. At one time, when he was contemplating a sale to his partner on account of ill health, he had made an estimate of the value of his stock of goods which subsequent inventory showed to be within \$53.75 of the correct amount, on a business of some \$37,000. He had simply struck an average on the basis of so many dollars' worth of business making so many dollars gross, and then estimating the cost of doing a dollar's worth of business, and it was simply a matter of multiplication after that.

The Chair thought that while some druggists seemed to be able to do that with success, on the whole it would lead to very grave errors, as he had discovered by actual examination. He had repeatedly seen inventories vary from \$300 to \$2,000 from what was thought to be a correct estimate.

Mr. Mittelbach had found the practice of trying to fix a percentage of loss on open accounts rather unsatisfactory. In his State (Missouri) they have a law of limitation, and such accounts are barred after a certain time, and his habit has been to simply charge them up to profit in his loss-and-gain account, and if one of these outlawed accounts is ever unexpectedly collected he credits it to the same account. The difference between the two sides of debit and credit gives the net loss for the year.

Mr. Mayo, referring to the statement in Mr. Mason's paper that a salary for the proprietor should be charged up at what he would have to pay a manager, thought the difficulty was in establishing what this should be. He suggested that it might be fair to place it at what would have to be paid the senior clerk, where several clerks are employed in the business.

A recent investigation of his own of a business of long standing, and apparently very profitable, showed that the proprietors only made a clerk's salary: they had made no deduction in their running expenses for their own salaries.

Mr. Mason said he had found in actual practice that the average druggist, doing a business of some ten or fifteen thousand dollars a year, charged himself a salary running between a thousand and fifteen hundred dollars, and he would suggest twelve hundred. He did not think it was so difficult to arrive at these figures as had been indicated, especially in these days, when there are so many branch concerns that proprietors find out what they have to pay managers. A good manager cannot be had short of \$1,200, and a first-class man will command \$1,500, where the size of the store warrants. The average is from \$1,000 to \$1,500. Some men in small towns, where they manage to live on it comfortably, charge themselves only \$900, and what they have left in the way of net profits is surplus earnings.

As to the depreciation in book accounts, this was a troublesome question, and he could not pretend to lay down any hard-and-fast rule; he would think each man would have to be the judge of his own individual accounts. It is hard to decide on a definite percentage, as it may be five per cent. one year and a half per cent. the next. He must arrive at that in figures, and not percentages.

Mr. Hynson thought Mr. Mittelbach's plan was the plan generally adopted by public accountants in all the States which have laws of limitation. If an account is outlawed, of course it is lost, to all intents and purposes, and if accidentally recovered it is credited on the next year's business.

The Chair said the hour was late (after six o'clock), but nominations for officers of the Section were mandatory at this session, and he would be glad to receive same.

Thereupon Mr. Hynson nominated Mr. Mason himself for Chairman of the Section next year, and Mr. Burge seconded the nomination. Mr. Mayo nominated Mr. E. H. Ladish, of Chicago, for Secretary. For the three Associates on the Committee, the following were put in nomination: W. M. Bowman, of Toledo, by Mr. Sayre; P. Henry Utech, of Meadville, Pa., by Mr. Apple, and Arthur L. Cheney, of Morrisville, Vt., by Mr. Hynson. No other nominations were made at this session.

On motion of Mr. Eberle, the Section then adjourned.

## SECOND SESSION—THURSDAY AFTERNOON, SEPTEMBER 10, 1908.\*

The second session of the Section on Commercial Interests was called to order at the Hotel Eastman, at 3:15 p. m. by acting Chairman H. B. Mason. The minutes of the first session, held on Tuesday afternoon, were read and approved. The report of the special committee on Parcels Post was then read by Mr. H. D. Kniseley, chairman of the committee. Upon motion, duly seconded, the report was approved.

## REPORT OF COMMITTEE ON PARCELS POST.

*To the Chairman and Members of the Commercial Section, American Pharmaceutical Association:*

Your Committee on Parcels Post appointed by the President of the A. Ph. A., in conformity with a resolution adopted by this Section at our New York meeting last September beg leave to report as follows:

We have made progress in our work by keeping it in close touch with our Congressmen, and being advised from time to time that no legislation contemplating radical changes in postal laws would be enacted during the last session of Congress, therefore, we have not worked so much as we have watched.

We secured all the resolutions and arguments submitted at State Associations and elsewhere to use when notified by our representative in Congress.

We also beg leave to report that some of the resolutions adopted by retail associations are strong arguments, and each of us should be active in getting all organizations enlisted in our sympathy and with the combined influence we can defeat any parcels-post legislation that will be antagonistic to our interest as retail pharmacists.

Your Committee recommends that a like committee be appointed by the incoming President, and that this committee be asked to secure the address of each Congressman, and that a letter be addressed to him by each member of this Association from such Congressman's home town asking that he personally interest himself in defeating postal legislation unfavorable to us as retail pharmacists.

Respectfully submitted,

H. D. KNISELEY, *Chairman*,  
A. V. PEASE,  
WM. MITTELBACH,  
*Committee.*

*Hot Springs, Ark., September 7, 1908.*

Mr. A. V. Pease then caused to be distributed the following list of topics, which he had prepared for discussion at this session:

## LIST OF TOPICS FOR DISCUSSION.

BY A. V. PEASE.

1. Co-operative buying in small local groups or by some wide-spread plan, use A. D. S. or Rexall.
2. Finding, picking and keeping employees. Personal experiences. What way of finding them? Selecting as to fitness and keeping them satisfied.

---

\* Unfortunately the local stenographer, who had been engaged to report the second session while the official stenographer was engaged in the Section on Scientific Papers, failed absolutely to make a report, and the General Secretary has compiled the minutes etc., from data furnished by Mr. Mason.

If educational standards are materially raised will it be possible to get help at reasonable wages?

3. Cashier or cash-register system, or combination of both. How large must a business become to afford the cashier system? Division of work or hours of service.

4. Advertising a retail drugstore. Relative value of store windows; reputation for knowledge and reliability and newspaper advertisements.

What weekly appropriation for show windows? What per cent. of gross sales for advertising in newspapers?

5. Annual inventory. Systematizing the work. Preliminary preparation and accounting. Weighing and tagging articles that are bulky or numerous.

Why write in detail names of all chemicals, fluid extracts, etc., instead of grouping under class name? All goods marked with cost mark. Every store possesses certain sections that have a stationary value year after year.

Keeping track of the fixtures in special list by itself.

6. Good book-keeping and what it should show. No system complete unless it introduces the principle of double entry. From such a set a statement of resources and liabilities can be made. And with such a start a weekly balance or summing-up can be made that always makes the proprietor clearly understand his profit or loss.

7. Building up the "trailers." What class of remedies are best to make? Start with a few and give them close attention. They will bring the next "bunch" trailing along behind. Let each remedy contain some suggestion about all the rest. Printed enclosures.

Cartons and wrappers for all the common remedies. Labels to be filled with accurate directions. Printed cartons for all dry drugs that are practicable. Each carton to contain accurate directions and useful collateral information. Purchaser gets impression you are reliable and trustworthy. Cannot place too strong an emphasis on reputation.

8. Get farmers' and kindred trades for city merchants as well as country. Truck farmers, gardeners and real-estate owners often want accurate information and drugs.

Insecticides, fungicides and prophylactic remedies. Foster the business.

The customer knows he wants something for some pest bothering either plant or animal. If you can tell him the remedy he remembers to rely on you.

Suggestive occasions that are worth while to know about: Apple tree leaf blight, codling moths, cabbage worms, Colorado beetles, rust in oats, diseases of chickens, anthrax in cattle, pests in dogs, affections of pet birds.

Never encroach on the province of the veterinary surgeon.

Department of Agriculture, a mine of information on nearly all of these topics. Given freely: Department of Forestry, Bureau of Animal Industry, Farmers' Bulletins.



9. Shall drugstores sell liquors?

Personal expressions both ways.

10. Does it affect your relations with physicians to permit your name to follow patent-medicine advertising?

11. What percentage of total business is prescription work? Percentage of gross profits? Estimates of additional business brought by prescription work.

A somewhat lengthy and rather informal discussion of the several topics then took place, which was participated in by Messrs. C. H. Avery, Louis Schulze, E. H. Ladish, F. W. R. Perry, A. F. Sala, A. V. Pease, A. T. Miller, H. B. Mason, J. B. Bond, Sr., L. A. Seltzer and J. B. Todd (the latter being present by invitation as guest of the Section).

The following paper on Fire Insurance, by Jas. S. Gleghorn, of Allegheny, Pa., was read by C. H. Avery in the absence of the author, and was discussed by Messrs. E. H. Ladish, A. V. Pease, G. B. Kauffman, J. B. Bond, Jr., C. H. Avery and J. B. Todd.

#### FIRE INSURANCE.

BY JAMES S. GLEGHORN, PH. G.

What do you know about fire insurance, the institution that most intimately concerns you in case of loss by fire? One fire-insurance policy may look as good as another to you, but, wait until a fire occurs, then you might find out there's a difference, when it is too late. One policy may prove of value where another would prove worthless. The first thing you should bear in mind when taking out fire insurance, is that the standard form of fire insurance, is not written in your interest, but in that of the company issuing the insurance. It therefore behooves every pharmacist to pay special attention to all details and requirements set forth in the policy. You should study the question of fire insurance more, and not depend so much upon information derived from those engaged in the insurance business. Read your fire-insurance policy as carefully as you would a bill of sale were you buying a drugstore; if you do this you are not so likely to pay annual premiums on policies on which claims could not be collected. For the benefit of those members who are not as well posted on fire insurance as they should be, I have compiled the following valuable information, from various well-known authorities, who are exceptionally well qualified to furnish this desirable information through having made fire insurance a life study. To begin with we will define fire insurance. Fire insurance is defined as a contract whereby for a stipulated consideration a fire insurance company undertakes to compensate its policy holders against loss or damage by fire for a certain compensation (a premium). The written contract is called the policy—a policy against fire is strictly a policy on time, and the commencement and termination

of the risk is stated with precision. There are various kinds of fire insurance companies, the principal ones being either the stock or mutual companies.

A stock fire insurance company is a company in which certain persons own all the capital and take all the profits by way of dividends, similar to any other mercantile or financial incorporation. Stock fire insurance companies generally insure the full value of the property insured, and will take many classes of insurance that a mutual company would decline.

In the case of mutual fire insurance, every one insured becomes thereby a member, and the net profits, or a certain proportion of them, are divided among the members in such a manner as the charter or by-laws of the company may direct. Insurance in mutual companies is generally much cheaper than in stock companies. The premium paid and the premium notes constitute the whole capital or fund out of which the losses are to be paid. Mutual companies are generally restricted by their charter from insuring more than a certain moderate proportion, as from one-half to three-fourths, of the assessed value of the property. You should see that your fire-insurance policies are carefully and intelligently prepared in order to prevent conflict with the terms and conditions of the standard form.

The standard form is the governing contract of a fire insurance policy, therefore great care should be taken to see that all representation of facts are true, as concealment, according to the policy, is the converse of representation. The insured, in making application for insurance, is bound to state all that he knows himself and all that it imports the underwriter to know. A suppression of the truth has the same effect as an expression of what is false, and the rule as to materiality and substantial compliance is the same.

Reasonable grounds of apprehension of loss and actual facts known to the insured denoting impending dangers must be stated to the insurance company, otherwise the policy is void, even though there was no intentional fraud in the case. Any statements made, either in application for the insurance or for a separate cover with reference to the insurance, and for the purpose of obtaining the insurance, and which is distinctly referred to in the policy and declared to be a warranty or condition on which the policy is made, are regarded as positive warranties.

There is an alienation clause, which renders a policy void if any change other than the death of the insured takes place in the interest, title or possession of the insurance, excepting change of occupants without increase of hazard, whether by legal process, or judgment or voluntary act of the insured. The section means any parting with or sale of the premises and does not include the giving or taking of a mortgage upon the insured premises.

I would also like to call your attention to the assignment clause.

A fire insurance policy is not assignable, and if assigned without the consent of the company it is void.

There is also the condition of insurance clause which states that the market or cash value of the property at the time of the fire is the amount that can be recovered from the insurance company ; provided, however, the loss does not exceed the amount of the policy. If the property is only partially destroyed the amount that may be recovered is the difference in the value before and after the fire.

A fire insurance company generally reserves the right to rebuild or repair, and in case the insurance company so elects to do, it takes the place of money damage.

You should note the clause entitled, "Other insurance." This clause provides that the policy shall be void in case the policy-holder now has or shall hereafter make or procure any other contract of insurance whether valid or not on the property covered in whole or in part by the policy. The waiver of this clause to be printed on the form should read, "Other insurance permitted without notice until required."

The lightning clause attached to a policy only protects the insured when ignition actually takes place ; otherwise the company is not liable. The clause relating to notice of loss requires the insured to give immediate notice to the company. The conditions of the policy require this notice to be in writing. The damaged goods must be inventoried and a proof of loss duly sworn to and filed within sixty days. A good many policy-holders seem to think that a fire-insurance agent is the agent of the insured, when such is not the case ; the fire insurance agent is the agent of the company. The law does not permit the agent of a fire-insurance company to act on behalf of the two principals, the buyer and seller, without the consent of both ; therefore, the agent's sole duty is to his company, and not to the insured. An acceptance of an insurance policy from an agent is an admission that the facts contained in the policy are correct.

What re-insurance means. The following illustration will explain quite fully what re-insurance means: Suppose the American Druggists' Fire Insurance Company were to take a risk on John Doe's drug store for an amount of \$8,000. If John Doe's drug store is completely destroyed by fire, and the fixtures and stock are worth \$8,000 or more, the American Druggists' Fire Insurance Company are liable for that sum to John Doe. Therefore the American Druggists' Fire Insurance Company have an insurable interest in John Doe's drug store to the amount of \$8,000. The Penn Fire Insurance Company make an arrangement with the American Druggists' Fire Insurance Company to take one-half the risk. This is called re-insurance. The American Druggists' Fire Insurance Company may desire to do this for two reasons : first, as they may not wish to carry so heavy a risk on a single drug store ; and second, the Penn Fire Insurance Company may be willing to take it for a less rate of premium than

the American Druggists' Fire Insurance Company have received. So the American Druggists' Fire Insurance Company have a clear gain of the difference of premium.

The co-insurance clause. There has been much discussion and misunderstanding of the technical term of the co-insurance clause, and many a policy-holder has been misled by explanations that are not true to conditions. The following explanation of the 80 per cent. and 100 per cent. co-insurance clauses should be sufficient to set the matter right in the minds of all our members :

The New York standard eighty per cent. co-insurance or average clause reads as follows :

"This company shall not be liable for a greater proportion of any loss or damage to property described herein than the sum hereby insured bears to eighty per centum of the actual cash value of said property at the time said loss shall happen. In case claim for loss on property described therein, not exceeding five per cent. of the maximum amount named in the policies written thereon and in force at the time such loss shall happen, no special inventory or appraisal of the damaged property shall be required."

If the insurance under this policy be divided into two or more items these clauses shall apply to each separately. In the event of the insurer having in force to an amount equal to or exceeding eighty per cent. of the actual cash value of his property, the co-insurance clause has no bearing whatever upon an adjustment any more than if it was contained in the policy. If, on the other hand, the insurance falls below eighty per cent. of the property value and a partial loss is sustained, the clause becomes operative—though in case of total loss it would be of no effect.

The New York standard one hundred per cent. co-insurance or average clause reads as follows :

"This company shall not be liable for a greater proportion of any loss or damage to property described herein than the sum hereby insured bears to one hundred per cent. of the actual cash value of said property at the time such loss shall happen.

In case of claim for loss on the property herein not exceeding five per cent. of the maximum amount named in the policies written thereon and in force at the time such loss shall happen no special inventory or appraisal of undamaged property shall be required."

If the insurance under this policy shall be divided into two or more items, these clauses shall apply to each item separately. In the event of the insurer having insurance in force to an amount equal to or exceeding one hundred per cent. of the actual cash value of the property, the co-insurance clause has no bearing whatever upon an adjustment any more than if it was not contained in the policy. If, on the other hand, the insurance falls below one hundred per cent. of the property value and a

partial loss sustained the clause becomes operative, though in case of total loss it would be of no effect.

As the subject of fire insurance is one of great magnitude, upon which a book might be written, I have made no attempt to cover it in its entirety, but instead have endeavored to select such information as would likely prove of greatest benefit and value, and at the same time make clear any clause in your policy not thoroughly understood. If I have succeeded in doing this I feel amply repaid for the time spent in the preparation of this paper.

Mr. L. F. Kebler then read his paper entitled "Commercialism in Drugs" which was discussed by Messrs. G. B. Kauffman, H. B. Mason, C. S. N. Hallberg, J. B. Bond, Jr., C. A. Mayo, E. H. Ladish and Louise Schulze.

#### COMMERCIALISM IN DRUGS.

BY L. F. KEBLER, PH. C.,

*Chief of Drug Division, Bureau of Chemistry, U. S. Department of Agriculture.*

The term "*commercial*" as used in the past in connection with certain commodities meant either manipulated or adulterated goods or articles of doubtful quality; for example, the term "sandalwood oil, commercial" was commonly applied to a mixture consisting in part of some questionable sandalwood oil mixed with such solvents as the ingenuity of the manipulator found to his advantage, and under the name "oil of origanum, commercial" was sold a mixture which did not contain a drop of the oil after which the preparation was named. An imitation, pure and simple. "Black antimony powder, commercial" consisting of a mixture of charcoal, sulphur and powdered limestone, but not a trace of any antimony compound. In this connection, attention should be called to another evasive form of labeling which is represented by the name "oil of wintergreen, natural," applied to oil of birch. Will the courts sustain such a misrepresentation? The use of the word "commercial" in connection with drugs and many other products is however largely ancient history. Some of the above practices were undoubtedly brought into vogue by the fact that many commercial men had little thought of quality, being concerned chiefly in a few dollars a transaction would net.

At present great efforts are being made in some quarters to import adulterated and inferior products which are in many cases unsafe, improper and dangerous for medicinal purposes. One of the schemes resorted to is to mark questionable goods with the phrase "for technical use," attempting by this ruse to hoodwink the officials. Many arguments are advanced by certain dealers, brokers, and importers justifying transactions in inferior, adulterated and manipulated goods of which the following are the most common:

First. There would not be enough of the pure material to supply the demand.

Second. The price of pure goods would be so much enhanced as to prohibit their sale.

Third. Full-strength products would not satisfy the tastes of many consumers.

Fourth. Certain goods are not used directly, but are employed in the manufacture of other preparations.

Fifth. Articles of standard quality would be detrimental to the welfare of the public.

The fallacies of most of these arguments are apparent to all except those interested solely from a commercial point of view. I shall now consider these arguments seriatim with examples.

#### NOT ENOUGH PURE MATERIAL TO SUPPLY DEMAND.

A contention to the effect that there would not be enough material to go around if commodities of proper strength were supplied is not deserving of much consideration, because such a contingency is abnormal except when developed through commercialism. For example, there is at present a considerable scarcity of available "oil of gaultheria," but this is not because there would not be enough of the genuine product under normal conditions, but because spurious imitations, such as methyl salicylate or a mixture of methyl salicylate and oil of sweet birch have been sold in place of it for a number of years at a cheap price and the demand for the genuine, more expensive article has been greatly diminished; a condition which has nearly crushed out an important industry, but let there be the proper demand at a reasonable price for "oil of wintergreen" and there will be an ample supply, in fact, the enforcement of the laws requiring honest labels has materially stimulated activity in this industry. Congressmen at the request of physicians have asked the Bureau of Chemistry to investigate the substitution of oil of wintergreen because some of the products supplied as coming from the genuine plant are causing alarming symptoms in their patients.

Some excuses are offered for adulterated asafetida, senna, belladonna root, etc. A contention made at times for asafetida is that an article of pharmacopœial quality could not be grown, but this position was soon shown to be groundless, and asafetida of proper quality is at present imported. Another class of goods which would suffer (?) greatly, it is contended, if these inferior products were no longer available are the so-called cattle or stock powders, in the manufacture of which all sorts of debased ingredients have been and still are used, such as exhausted drugs and seeds from which the medicinal and condimental agents have been removed. An example of the former is the dried residue left in the manufacture of gentian preparations and of the latter is caraway seed which has been deprived of its oil. This practice of preparing debased goods for cattle is quite contrary to the opinion that obtains with farmers, who

believe that cattle and other livestock should receive as much if not greater consideration than is accorded the human race. Honest, reliable and square dealing in pure drugs is welcomed by all except such as have been engaged in questionable practices and desire to continue in the business.

Some dealers and manufacturers are apparently adverse to adulterating goods themselves, but have no scruples whatever in using these commercial or sophisticated articles in the manufacture of some of their preparations. Such delectable dealings must have a wonderfully soothing effect on an otherwise troubled conscience.

#### HIGH PRICE BAR TO SALE OF PURE GOODS.

For drug products this is a most untenable position. Who for a moment would consider the price of a drug when the life of a dear one is at stake.

Adulterated, manipulated and inferior goods are with few exceptions more costly in proportion to their medicinal value than the straight or pure products. For example, colocynth or gamboge adulterated with 25 per cent. of starch is sold at 10 per cent. less than the pharmacopoeial product, but its strength is 25 per cent. below that of the genuine article. Again some manufacturers are substituting quinine sulphate by the other cinchona alkaloids because of the high price of the former. Not much economy here except for the adulterator. The consumer would not purchase such goods if acquainted with the facts. Give the consumer a square deal.

#### FULL STRENGTH GOODS TOO STRONG.

This argument has frequently been advanced in the past in connection with pure pepper, justifying dilution on the ground that, if it were sold in the pure state the consumer would complain that the article was entirely too powerful. A pepper diluted with three parts of some inert substance like olive stones, is claimed to give better satisfaction. The vendor loses sight of the fact that the consumer hitherto has rarely had an opportunity to taste the pure article. Let the consumer decide this for himself. He will soon learn that one shake of the pure product at double the price of the former will impart as much flavor as four shakes of the adulterated. This same logic is also advanced in connection with cinnamon, extract of vanilla, tincture of ginger, spirit of peppermint, etc., but manufacturers are learning that consumers are much better satisfied with pure products than those adulterated or manipulated.

#### GOODS NOT USED DIRECTLY.

One of the most common arguments advanced in connection with crude drug products is that they are seldom used directly for medicinal purposes, but are employed in the manufacture of other preparations. A conspicuous example is the following: An importation of *asafetida* was detained

on the ground that it was not of proper quality and the attorney of the importer claimed that the asafetida was dried and powdered, and then used in the manufacture of asafetida preparations. He further maintained that asafetida was "standardized" by millers so that uniformity would result. So far we have been unable to find any authority describing methods for standardizing asafetida preparations in the manufacture of which powdered asafetida is employed. What methods are used by millers can only be conjectured, but if such methods are used they must be contained in the vest-pocket memorandum of the miller, for certainly we have been unable to find any record of such a procedure.

Importers frequently acknowledge the inferior and adulterated character of goods, but contend they are manipulated in the process of manufacture so that pharmacopœial preparations are the result. An example of this is the use of sarsaparilla rhizomes which are specifically directed by the United States Pharmacopœia to be rejected, in the manufacture of sarsaparilla products. What constitutes the manipulation referred to above is difficult to conjecture, but it is certain that if a druggist uses powdered senna, prepared from senna dust, containing as much as 40 per cent. of sand and other inorganic material, together with foreign plant-products, he will not produce products of the character indicated by the Pharmacopœia.

#### FULL STRENGTH DANGEROUS.

The preparations usually referred to in this connection are the opium products, and more specifically laudanum. There is no doubt but that in the past and to some extent at the present time laudanum of inferior quality was and is placed upon the market, and there may be some danger at the present time in selling a full-strength product without a warning. This condition, however, is artificial, being brought about chiefly by competition, one manufacturer endeavoring to sell his product cheaper than another. It may require some care in dispensing a full-strength tincture of opium, but many state laws at present prohibit the sale of opium products containing more than a certain amount of opium to the ounce of material, except on physician's prescriptions, and no one would think of filling prescriptions with opium preparations which deviate from the standard of the Pharmacopœia.

The danger to the welfare of the public in using debased drugs is clearly set forth by a quotation from Dr. Dixon, who says :

"For my part, I unhesitatingly express the belief that many hundreds of patients die annually from digitalis and allies not possessing the virtues which are required of them." No practice should be considered more reprehensible than that of supplying the unfortunate sick with medicinal remedies which are deficient in strength or unreliable in character.

#### IMPROPER STANDARDIZATION.

In the past and to some extent at present, manufacturers standardized



medicinal remedies by private methods. While such a procedure may be satisfactory in many cases it certainly is open to objection as will be shown shortly. Much henbane deficient in strength has been imported in the past, supposedly for the purpose of manufacturing pharmacopœial products. In some cases, however, the deficiency has been so great as to render it impossible to make preparations of pharmacopœial quality and manufacturers are resorting to standardizing such deficient preparations by using certain proportions of another drug known as hyoscyamus muticus. The alkaloidal strength of this product is very high but the nature of the alkaloids is totally different from those contained in henbane proper. It can readily be seen that an improper procedure of the above character is difficult of detection unless a large quantity of the finished product is submitted to analysis. It is far easier to prohibit the importation of a drug product which is unsafe, improper and dangerous for medicinal purposes than to intercept the preparations subsequently in the hundred and one channels in the United States. Another expedient resorted to is the diluting of pharmacopœial drugs assaying above the minimum standard to the minimum requirement with such inert substances as starch, powdered olive stones, etc. While there is no specific statement in the Pharmacopœia forbidding this practice it is certainly not recognized in many cases where it is practiced at present.

In conclusion be it said, however, to the credit of the large majority of manufacturers, dealers, and importers, that they are desirous of having the law enforced so as to establish honest competition and eliminate fraud and adulterations of all forms. They are not looking for the assistance of shrewd and cunning lawyers to devise ways and means for manufacturing, importing or shipping into interstate commerce adulterated and misbranded drug products.

The special committee of three, composed of Messrs. M. I. Wilbert, E. H. Ladish and A. F. Sala, to whom was referred, at the first session, the report of Mr. C. L. Diehl on propaganda activities, notified the Publication Committee that they have decided to have the report printed in the *Bulletin*, but not in the annual volume of Proceedings.

The last order of business was the election and installation of officers for the ensuing year, as follows: Harry B. Mason, of Detroit, Mich., as Chairman; Erich H. Ladish, of Chicago, Ill., as Secretary; Waldo M. Bowman, of Toledo, O., P. Henry Utech, of Meadville, Pa., and Arthur L. Cheney, of Morristown, Vt., as associates. The Section then adjourned.

# MINUTES

OF THE

## SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

---

FIRST SESSION—WEDNESDAY MORNING, SEPTEMBER 9, 1908.

THE first session of the Section on Pharmaceutical Education and Legislation was called to order by Chairman Joseph W. England, of Philadelphia, at 10:30 a. m. The Chair stated that in view of the length of the program it would be necessary to put a time-limit on papers of fifteen minutes, and a limit on discussion of five minutes by each member.

The Chair then called on his associate, Mr. Lucius E. Sayre, of Kansas, to preside while he read his address:

### ADDRESS OF THE CHAIRMAN.

*Fellow Members:* In the corridors of the new buildings of the Department of Medicine of the University of Pennsylvania there are oil paintings of the past teachers of this famous school, many of whom have helped to make the history of American medicine. Prominent among these is that of William Gibson, Professor of Surgery from 1819 to 1855, pointing with his forefinger to the words: "Principles! Principles! Principles!" It was ever his word of advice to his students; the thought being, that if they mastered the principles of surgery they would master all the specific applications.

And so it is with other forms of knowledge. If the underlying principles be mastered the applications thereof will take care of themselves or become chiefly matters of detail.

The possibilities of pharmaceutical science in this country are largely undeveloped, and yet the progress that has been made during the last half-century has been little short of marvelous. We have obtained a clearer knowledge of vegetable drugs and proximate principles; we have devised improved methods of drug-extraction and active principle, isolation; we have originated processes for standardization, both chemical and physiological; we have improved the methods of manufacture for many of the older chemical compounds and discovered countless new compounds and our galenical preparations excel in elegance and efficiency. But we have now come to the point where the *details* in all the branches of pharmaceutical endeavor—scientific, educational, legislative and commercial—have become so innumerable that, for their proper utilization, the *general principles* underlying them should be most carefully studied and crystallized, so that these may serve as charts for future work.

We need education in general principles. Our colleges should get together and study the principles of teaching, so that the instruction given to students may be better balanced and co-ordinated. Our state boards of pharmacy should get together and digest the principles of examination, so that the examinations may be standardized and lead ultimately to the general interchange of state certificates. Our state and local pharmaceutical associations or their legislative committees should get together and consider the principles of pharmaceutical legislation, so that the state and national laws may be simplified and harmonized and the public be better protected against incompetency, or worse, in pharmaceutical practice.

In his address, as Chairman of the Council of Medical Education of the American Medical Association, to the fourth annual conference of the Council and allied medical bodies, Dr. Arthur Dean Bevan states (Bulletin A. M. A., May 15, 1908, 251): "From about twenty of our leading colleges it has been learned that while the tuition fees from each medical student amounts to only from \$75.00 to \$180.00, the actual expense of teaching that student per year ranges from \$250.00 to \$600.00 or more each year."

This fact and the absence of sufficient income over and above that received from the fees of students, is what has forced twenty-three medical colleges to unite during the past three years, leaving nine larger and stronger ones. The Journal of the A. M. A. states editorially (Journal A. M. A., 1908, 229), with reference to this, that, "It is evident that the merging of our numerous small and poorly equipped medical colleges into a less number of well-equipped and strong institutions, is the most encouraging part of the movement for higher standards of medical education in the United States."

No facts are available at present regarding the tuition fees received from pharmaceutical students by schools of pharmacy, but the annual fee averages, it is thought, from about \$50.00 to \$100.00, while the expense of teaching is, probably, in all cases, fully as much or more. Within a recent period the New York College of Pharmacy has combined with the Columbia University, and the Baltimore College of Pharmacy with the University of Maryland, while still more recently the Scio College of Pharmacy, of Scio Ohio, has consolidated with the Pittsburgh College of Pharmacy. Whether these changes are part of a general movement or not remains to be seen, but there is no question that at the present time there is no real need for ninety schools of pharmacy in this country. One half this number could do the work better than it is done. Few of the schools have received endowments, although some receive a part of the state appropriations made to state universities.

Hence, if the smaller schools would combine, their faculties for instruction would be increased, their instructors better paid, and the general condition of pharmaceutical education would be distinctly improved.

Legally, pharmacy laws are enacted for the protection of the public, and not for the benefit of a privileged class. Incidentally, however, they should be framed to encourage honesty and competency among pharmacists, for in this way only can the public receive *safe* pharmaceutical service. No law is stronger than the public opinion behind it. If you want stronger pharmaceutical legislation educate the public sufficiently as to the need of better protection, and you will get the legislation. Public opinion, if strong enough, can force the passage of any law, no matter how much special interests may oppose it, as, for example, the recent passage of the anti-gambling legislation by the New York legislature advocated by Governor Hughes.

To-day the American people suffer from legal indigestion. We have too many laws and they multiply with bewildering rapidity. Whenever an onerous civic condition arises, the American citizen cries out for a new law, and is not "happy until he gets it," believing that legislation is the panacea for every civic ill. But legislation is no fit substitute for good, healthy public opinion strongly expressed. It is a notorious fact that if any civic condition arises that requires instant correction, and there is no specific law

covering it, and the public demands action, the prosecuting attorneys always find sufficient "common law" to cover the case, and "get busy;" but they don't "get busy," as a rule in such cases, until public opinion forces them to do so.

The pharmaceutical interests of this country need to look sharply after the interests of pharmacists in the matter of pharmaceutical legislation. The tendency of legislation regarding the sale of drugs has been too largely from the standpoint of the physician, and too little from that of the pharmacist. This was strikingly shown in the bill offered by Congressman Mann (House Bill 21982) a few days before the adjournment of the last session of Congress, wherein it was ostensibly proposed to regulate the sale of "habit-forming and poisonous drugs," but under which a large number of the drugs of the U. S. Pharmacopœia were finally mentioned and their conditions of sale by pharmacists made onerous.

If serious progress in simplifying and harmonizing pharmaceutical legislation is to be made—and in view of the mass of such legislation that has been recently enacted and will be enacted in the future, such a step will soon become necessary—then pharmacists should educate the people upon pharmaceutical conditions, for the people's own good. This is the policy that is now being pursued by the American Medical Association, and with signal success. This Medical Association is having its members take a "live" interest in public affairs, and is encouraging organized educational and legislative movements by local and state medical organizations in all sections of the country.

Not only does the general public need education upon medical matters, but the medical profession itself needs education upon the subject of drug-therapeutics. "During the past score of years," as the writer has previously stated ("What of the Future of Medical Practice," A. Ph. A. Bulletin, 1908, 204), "a remarkable change has taken place in the attitude of the medical profession towards the treatment of disease. With the discovery that communicable diseases were caused by pathogenic micro-organisms, the first step was to eliminate such organisms, as far as practicable. Then followed the development of preventive medicine, and the drugless treatment of disease; and for these there has been generated the highest degree of enthusiasm, and at the expense of the other branches of medical science, including treatment. To-day the tendency of the medical profession is to make a god of hygiene and sanitation, and a corpse of therapeutics;" and it is this attitude which has so greatly decreased the number of prescriptions written in recent years and forced retail pharmacists, in self-preservation, to sell "side lines" that have no legitimate place in drug stores. I do not believe that drug-therapeutics is dead or even dying. I have unbounded faith in the abiding good sense of the rank and file of the medical profession. I believe that the medical pendulum, in the matter of therapeutics, has swung to an extreme, and will soon swing back to the mean; and that the art of therapeutics—the greatest of all human arts—will be given new life, and will come into its own.

Strictly speaking, pharmacy is a branch of therapeutics. It is as much a medical branch as dental surgery is a branch of general surgery. It is unfortunate, from a scientific point of view, that pharmacy, as practiced in the United States to-day, is both scientific and commercial, but the condition exists, and the probabilities are most strong that it will continue to exist until the scientific work of pharmacists is better appreciated, both by the public and the physicians.

A prominent druggist of Baltimore (American Druggist, 1908, 87) expresses the opinion that: "The retail druggist, perceiving the low estimate placed upon his work, the disposition to regard him as a tradesman rather than the master of a profession, being furthermore brought face to face with the scant rewards accorded him in exercise of that profession, naturally turns to the commercial end of the business, as far less exacting in its demands, and as holding out the prospect of a competency. He does not rush into commercialism from choice, but because he finds that there is too little in the

drug end to meet even modest requirements, and for the reason that he feels his scientific attainments are being underrated."

As to the suggestion that physicians could do much to combat mistaken popular views as to the status of the retail druggist, his reply was: "Little or nothing can be hoped from that direction. To be very candid, the physicians themselves, with some exceptions, of course, are not disposed to accord pharmacists the recognition which they deserve, or to accept them on an equal professional footing. The average physician looks down upon the druggist as being hardly more than a tradesman, who gets his directions, and is expected to follow them. They may not avow the sentiment openly, but many physicians, nevertheless, harbor the conviction that the pharmacist is scarcely above the mechanic. It follows, as a matter of course, that they will take no special pains to encourage the public to entertain a better opinion. There has been more or less fraternizing in late years, and the two professions have been brought closer together, here and there, but we are still a long way from the point where the physician, unhesitatingly and willingly, sees in the pharmacist a co-worker in the field of medicine and sanitation."

Now, whether this attitude be correct or not, it certainly expresses the sentiments of a large number of pharmacists of this country, and prompts the query: "What of the future of pharmaceutical practice?" Will it continue as it has been, or will it be split into lines of work—the scientific and the commercial?

Is the possibility of scientific pharmacy an iridescent dream, or not? Or, has the plan of Prof. George H. Meeker (in a paper to be read before this Section), who urges the creation of "certified clinical chemists" for clinical chemical work, under the auspices of the American Pharmaceutical Association and the American Medical Association, serious possibilities? If the future practice of pharmacy is to be scientific *only*, then the volume of work must be large, or it will not pay, as the compensation is usually small, relatively; and if the work is limited in amount, then the number of workers will be limited also. On the other hand, if certified clinical chemists are to depend upon clinical work only, then they will have the competition of those who practice both scientific and commercial pharmacy.

The problem is one of peculiar difficulties. It may be that, in the larger cities, at least, a sufficient demand for such work could be created to support a limited number of scientific pharmacists or clinical chemists, especially in sections where numbers of physicians have their offices in professional buildings—though even this is doubted, at present, by some—and in the smaller cities, where the demand for such work must be limited, it is most improbable that such a movement would succeed.

But, there is no question of doubt that the problem is one worthy of your most careful consideration, because its solution may be pregnant with important possibilities for the future of American Pharmacy.

The address of the Chairman was greeted with applause.

The Chair called for action on the address just read, and Mr. Payne, of Georgia, moved to refer to the Committee on Publication, there being no recommendation embodied in the address. This motion was seconded and carried.

Mr. England resumed the chair.

The Chair called for the report of the Secretary, Mr. LaWall, of Philadelphia. Mr. LaWall read his report as follows:

## REPORT OF THE SECRETARY OF THE SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

*Gentlemen:* The work of tabulating the statistical facts, which was so ably begun by my predecessor, who is now the Chairman of this Section, has been continued in so far as it was possible to do so from the replies received from institutions, boards of pharmacy, and State associations which are included in this report. A copy of last year's report, giving statistics for 1906, was sent to each of these bodies with the request that they would change the figures to those for 1907. A tabulated statement, based on the replies received, is given herewith:

## SCHOOLS OF PHARMACY.

1. What are the entrance requirements as to age and preliminary education?
2. How much practical experience in drug stores, if any, is required for graduation?
3. What was the total attendance in your institution for the year 1907-1908?
4. What was the total number of graduates in the same year?
5. What is the total number of weeks of instruction from matriculation to graduation?
6. What is the total number of hours of obligatory attendance weekly?
7. What is the total number of hours of obligatory lecture work, of obligatory laboratory work, and of other obligatory school work, if any?

## ALABAMA.

*Auburn: Alabama Polytechnic Institute, Department of Pharmacy.*

- a. Entrance requirements (age and preliminary education).  
2 year course; age 16; one year in high school.  
4 year course; age 15; graduation from a good high school or equivalent education.
- b. Drug store experience required for graduation.  
None.

*Mobile: University of Alabama, Department of Pharmacy.\**

- a. Entrance requirements (age and preliminary education).  
Age 18 years; public school education; good moral character.
- b. Drug store experience required for graduation.  
None.

## CALIFORNIA.

*Los Angeles: Southern California University, College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).  
Applicants for matriculation must be at least sixteen years of age, and furnish evidence of their ability to prosecute the work of the course successfully. The preliminary education must be equivalent to that required for entrance into a high school.
- b. Drug store experience required for graduation.  
Four years.

*San Francisco: California College of Pharmacy, University of California.*

- a. Entrance requirements (age and preliminary education).  
For the Degree of Pharmaceutical Chemist; Applicants for matriculation must be at least eighteen years old, except in the case of graduates of high schools or of accredited schools, who are admitted when seventeen years of age.  
Applicants will be accepted who bring any of the following credentials:
- a. Certificates of graduation from high schools.
- b. Diplomas of graduation from schools or academies accredited by the State University. (See Register of the University of California.)

---

\* No new report.

- c. Certificates of high standing in other institutions of collegiate grade.
- d. Diplomas from normal schools of this State.
- e. First-grade teachers' certificates of this State.
- f. Certificate of having completed satisfactorily the second year's course in a high school in this State.

Applicants who do not present any of the foregoing credentials will be examined in the following branches:

- a. *English.* Grammar and composition.
- b. *Geography.*
- c. *Arithmetic.* Fundamental rules; fractions, common and decimal; denominate numbers; percentage; proportion; weights and measures; metric, apothecaries' and avoirdupois.
- d. *Algebra,* to quadratics with one unknown quantity.
- e. *Latin.* Elementary. The applicant will be expected to be able, with the aid of a dictionary to translate simple Latin sentences into English, and *vice versa*, and to analyze grammatical forms.
- f. *Geometry.* Elementary, including mensuration of solids.

For the Degree of Bachelor of Pharmacy: Applicants for matriculation must have received a degree in Letters or Science, or have been matriculated in the University, or present a diploma from an accredited high school or other institution, whose *credentials will be accepted for entrance to the Colleges of Letters, Arts or Sciences of the University.* Those who cannot present such credentials are required to take the entrance examinations at Berkeley.

- b. Drug store experience required for graduation.

None.

San Francisco: *College of Physicians and Surgeons of San Francisco.*

- a. Entrance requirements (age and preliminary education).

Age 18 years; two years of high school or its equivalent.

- b. Drug store experience required for graduation.

For the degree of Pharmaceutical Chemist no practical experience is required. For the degree of Doctor of Pharmacy three years of practical experience prior to matriculation.

#### DISTRICT OF COLUMBIA.

Washington: *George Washington University, National College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

Seventeen years of age, one year of high school work.

- b. Drug store experience required for graduation.

None.

Washington: *Howard University, Pharmaceutical College.*

- a. Entrance requirements (age and preliminary education).

Not less than seventeen years. One year high school work or equivalent.

- b. Drug store experience required for graduation.

Four years. Will not be required after 1908-9.

#### FLORIDA.

Jacksonville: *Florida College of Pharmacy.*

Sessions suspended until further notice.

GEORGIA.

Athens: *University of Georgia, School of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

"The applicant must be not less than eighteen years of age, and must have been successfully vaccinated."

No entrance examination is required except for those applying for admission to the senior class.

- b. Drug store experience required for graduation.

None required, some preferred.

Atlanta: *Atlanta College of Pharmacy.*

- a. Entrance requirements (age and preliminary education.)

Eighteen years of age, and a good common school education equivalent to the first grade of a high school, and must be of good moral character.

- b. Drug store experience required for graduation.

Two years either in a store or in our free dispensary.

Atlanta: *Southern College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

Common school education. Certificate of moral character. Not less than 18 years of age.

- b. Drug store experience required for graduation.

Candidate must have filled not less than 2,000 physicians' prescriptions in a drug store.

Macon: *Mercer University, School of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

Must hold certificate from high school or be graduates of recognized colleges, or stand an examination in Latin, mathematics, English grammar, etc. No age is mentioned in college, but student must be at least seventeen years of age.

- b. Drug store experience required for graduation.

One year is urged, though none is required.

ILLINOIS.

Chicago: *Illinois Medical College, Department of Pharmacy.*

Discontinued.

Chicago: *Northwestern University, School of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

For the degree of Graduate in Pharmacy: Age 17 years, one year of high school work, or its full educational equivalent.

For the degree of Pharmaceutical Chemist: Age 17 years, and two years of high school work.

- b. Drug store experience required for graduation.

None.

Chicago: *University of Illinois, School of Pharmacy, Chicago College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

Seventeen years of age. One year of high school work for Ph. G. degree. Four years of high school work for Ph. C. degree.

- b. Drug store experience required for graduation.

Four years for Ph. G., from which the time spent at college is deducted; none required for Ph. C.



## INDIANA.

*Angola: Tri-State College of Pharmacy.*

- a. Entrance requirements (age and preliminary education.)

Entrance requirements fixed by "Rulings of the Indiana State Board of Pharmacy, to which we conform in every particular."

- b. Drug store experience required for graduation.

None.

*Indianapolis: Winona School of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

Age, 16 years, and one year at high school, or its equivalent.

- b. Drug store experience required for graduation.

None.

*La Fayette: Purdue University, School of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

No requirements as to age. One year in a commissioned high school, or an equivalent in some other school, or an examination covering the same studies.

- b. Drug store experience required for graduation.

None.

*Notre Dame: Notre Dame University, Department of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

For the two-year program: 18 years, and a certificate of admission to the second year of a high school or an equivalent examination. For the three-year program: Certificate of credit of two years in a high school of reputable standing, or an equivalent examination.

- b. Drug store experience required for graduation.

None.

*Valparaiso: Valparaiso University, Department of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

Seventeen years of age, two years of high school work or equivalent.

- b. Drug store experience required for graduation.

None.

## IOWA.

*Des Moines: Highland Park College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

No report.

- b. Drug store experience required for graduation.

No report.

*Iowa City: University of Iowa College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

Completion of second year in a high school, and evidence of good moral character.

- b. Drug store experience required for graduation.

None.

*Keokuk: Keokuk College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

Creditable certificates of good moral character, signed by at least one druggist and one physician in good standing in the State from which the applicant comes, and a diploma or certificate of graduation from a grammar school; evidence of having passed the matriculation examination of a recognized literary scientific college, or a certificate or suc-

cessful examination by the faculty of any reputable university, college or high school, or by the State superintendent of public instruction in the following branches: English Grammar, Arithmetic, Elementary Physics, United States History, Geography.

b. Drug store experience required for graduation.

None.

#### KANSAS.

Lawrence: *University of Kansas, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No statement of age required. High school preparation and in addition one year of Latin, one year of physics and one year of botany, or, practically, one year of high school training. For the four year course, graduation from a high school having a four year course is required.

b. Drug store experience required for graduation.

None.

#### KENTUCKY.

Louisville: *Louisville College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Seventeen years of age. One year in a high school.

b. Drug store experience required for graduation.

Four years.

#### LOUISIANA.

New Orleans: *New Orleans College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

White, of good moral character, and at least seventeen years old. Candidates for admission to the Junior Class, who are *bona fide* legal residents of Alabama, Arkansas, Louisiana, Mississippi, Texas, Arizona, Colorado, Idaho, Nevada, New Mexico, Utah, Wyoming and Missouri, must pass an entrance examination in the elements of English education, including writing, spelling and arithmetic inclusive of decimals. A certificate showing completion of a grammar school course, will be accepted instead of examination. Matriculants from other states will be required, before being allowed to enter, to furnish to the dean evidence of having completed satisfactorily one year of work in an accredited high school or its equivalent.

b. Drug store experience required for graduation.

Four years.

New Orleans: *Tulane University of Louisiana, Pharmacy Department.*

a. Entrance requirements (age and preliminary education).

No age requirement for entrance. Must present certificate of good moral character, and evidence of preliminary education equal to a high school education.

b. Drug store experience required for graduation.

Two years. Must submit to the dean a satisfactory certificate of at least two years' practical experience under the instruction of a competent pharmacist. Time actually spent in the pharmaceutical laboratory will be credited as experience.

#### MAINE.

Orono: *University of Maine, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No requirement as to age. The entrance requirements for the two year course are a knowledge of the following branches; Descriptive geography, arithmetic, English grammar, physiology, United States history and algebra through equations of the first degree.

For the four year course, the entrance requirements are the regular 26 points as for the other B. S. course of the university.

b. Drug store experience required for graduation.

None.

#### MARYLAND.

Baltimore: *University of Maryland (Department of Pharmacy), Maryland College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Seventeen years of age and one year's work in an approved high school, or its equivalent.

b. Drug store experience required for graduation.

None.

#### MASSACHUSETTS.

Boston: *Massachusetts College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Seventeen years, and one year in a standard high school or its equivalent.

b. Drug store experience required for graduation.

Four years.

#### MICHIGAN.

Ann Arbor: *University of Michigan, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Sixteen years old, and a graduate of a good high school or its equivalent.

b. Drug store experience required for graduation.

None.

Big Rapids: *Ferris Institute, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

None.

b. Drug store experience required for graduation.

None.

Detroit: *Michigan College of Medicine and Surgery, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No report.

b. Drug store experience required for graduation.

No report.

#### MINNESOTA.

Minneapolis: *Minnesota Institute of Pharmacy.*

a. Entrance requirements (age and preliminary education).

There are no age or educational requirements.

b. Drug store experience required for graduation.

No report.

Minneapolis: *University of Minnesota College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

*Two year course.*—Matriculants of the two year course are required to have certificates showing a four year high school course, or its equivalent, provided that among the subjects completed are: English, 2 years; Algebra, 1 year; Geometry, 1 year; Physics, 1 year; and Latin, 2 years.

Students may enter with two one-year conditions or three half-year conditions.

The requirements for the *three year course* are the same as those for admission to the two year course, with the exception that students may carry as conditions not more than three of the entrance subjects, among which English cannot be.

b. Drug store experience required for graduation.

None.

#### MISSOURI.

Kansas City: *Kansas City College of Pharmacy and Natural Sciences*

a. Entrance requirements (age and preliminary education.)

At least seventeen years of age, of good moral character and one year in a high school or its equivalent.

b. Drug store experience required for graduation.

Four years.

St. Louis: *Barnes College of Pharmacy.*

a. Entrance requirements (age and preliminary education.)

At least sixteen years of age; must furnish evidence of ability to prosecute the course of work successfully, and must furnish evidence of having attended school, and passed examination in the elementary English branches and the rudiments of Latin. If, however, the applicant has never studied Latin, he will be required to take the Latin course provided for in this institution free of charge. The applicant must be possessed of a good moral character.

b. Drug store experience required for graduation.

Four years including the two years in college.

St. Louis: *St. Louis College of Pharmacy.*

a. Entrance requirements (age and preliminary education.)

An entrance examination in the common school branches, and certificates of having passed school examinations entitling the applicants to enter high schools or colleges.

b. Drug store experience required for graduation.

Four years for Ph. G., none for Ph. B.

Four years for Ph. C.

#### NEBRASKA.

Omaha: *Creighton College of Pharmacy.*

a. Entrance requirements (age and preliminary education.)

"No one should undertake the study of pharmacy who has not, at least, a good common school education, or such qualification as would enable him to enter a good high school. A complete high school course is a great advantage. Since the law of the State fixes no standard of scholarship for candidates for registration, the college authorities use their own judgment in fixing entrance requirements. Some young men who have never had the advantage of a high school course, but who are well grounded in the common branches, do as good work as do some graduates of high schools. No one who is able to do the work required will be deprived of any of the privileges of a course in pharmacy. A person who has not the qualification necessary to enter a good high school cannot be admitted. A knowledge of Latin, Physics, Botany, or Chemistry is not required for entrance. Generally speaking, no entrance examinations are demanded, but in some cases it is necessary for the candidate to take such an examination in order to determine his ability to do the work of the course. Those entering for the degree of Pharmaceutical Chemist must be graduates of a twelve-grade high school and must have

completed the Ph. G. course in this college or an equivalent course in some other good college of pharmacy."

b. Drug store experience required for graduation.

Two years.

#### NEW JERSEY.

Newark: *New Jersey College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

A certificate of graduation from a grammar school, or from a public or private high school; or passing an examination before us in arithmetic, spelling, writing, general history and geography; also, a certificate of preceptor is required.

b. Drug store experience required for graduation.

Four years.

#### NEW YORK.

Albany: *Union University, Department of Pharmacy. Albany College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age seventeen years, and a Pharmacy Student's certificate issued by the New York State Educational Department, which represents one year's work in an accredited high school, or its equivalent.

b. Drug store experience required for graduation.

None.

Brooklyn: *Brooklyn College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age seventeen years, and a Pharmacy Student's Certificate.

b. Drug store experience required for graduation.

None.

Buffalo: *Buffalo College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age seventeen years; satisfactory evidence of good moral character, and a Pharmacy Student's Certificate.

b. Drug store experience required for graduation.

None.

New York: *Columbia University, Dept. of Pharmacy (College of Pharmacy of the City of New York).*

a. Entrance requirements (age and preliminary education).

Age seventeen years, and a Pharmacy Student's Certificate.

b. Drug store experience required for graduation.

None.

#### NORTH CAROLINA.

Chapel Hill: *University of North Carolina, Dept. of Pharmacy.*

a. Entrance requirements (age and preliminary education.)

Age seventeen years, and high school education.

b. Drug store experience required for graduation.

Four years.

Raleigh: *Shaw University (Leonard College of Pharmacy).*

a. Entrance requirements (age and preliminary education).

No report.

b. Drug store experience required for graduation.

No report.

## NORTH DAKOTA.

Fargo: *North Dakota Agricultural College Dept. of Pharmacy.*

a. Entrance requirements (age and preliminary education).

*For the two year course:* At least seventeen years of age, and completion of first year in a high school or its equivalent.

The requirements *for the four year course* in pharmaceutical chemistry are the same as to age and for admission to the general science courses in this and other leading institutions. The actual requirements in pharmacy and underlying subjects are the same as in the two years' course. In addition to this there is required the same amount of work in cultural subjects as is found in the general science course.

b. Drug store experience required for graduation.

None.

## OHIO.

Ada: *Ohio Northern University, College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Our requirements are 17 years of age, and "first year in a standard high school or its equivalent" for the Ph. G. degree. For the Phar. D. degree, the student must have a diploma from a high school and four years' practical experience before entering.

b. Drug store experience required for graduation.

None.

Cincinnati: *Cincinnati College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

One year's high school work.

b. Drug store experience required for graduation.

None.

Cleveland: *Cleveland School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Seventeen years of age and a certificate showing the completion of one year of a good high school course, preferably in the following subjects: algebra, Latin and natural science, such as zoölogy and physical geography.

b. Drug store experience required for graduation.

None.

Columbus: *Ohio State University, College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age, seventeen years. Preliminary education: For short course, not less than one year of standard high school, first grade. For long course, graduation from standard high school giving four years' instruction.

b. Drug store experience required for graduation.

None.

Columbus: *Startling Ohio Medical University, College of Pharmacy.*

a. Entrance requirements (age and preliminary education).

"A common school education or the equivalent thereof, which shall include one year in a high school of first grade (Ohio), or an academy, legally constituted, providing a course of study of not less than four years." The minimum equivalent must embrace one year of instruction in each of the following branches: Algebra, English, Natural Science and History (United States or general history).

b. Drug store experience required for graduation.

No experience is required for graduation. Four years are required by the Ohio Pharmacy Board to obtain a certificate for registered pharmacist.

*Scio: Scio College of Pharmacy.\**

a. Entrance requirements (age and preliminary education).  
Seventeen years of age. One year in high school for Ph. G., or Ph. C. High school graduation for Pharm. D.

b. Drug store experience required for graduation.  
None.

*Toledo: Toledo College of Pharmacy.*

a. Entrance requirements (age and preliminary education).  
Seventeen years of age, and a common school education, or its equivalent, which shall include one year in a high school.

b. Drug store experience required for graduation.  
None.

## OKLAHOMA.

*Norman: University of Oklahoma, College of Pharmacy.*

a. Entrance requirements (age and preliminary education).  
Seventeen years of age.

Instruction in English.....	3 units	Instruction in Physics .....	1 units
“ “ History.....	1 “	“ “ Botany .....	1 “
“ “ Latin .....	2 “	“ “ Electives.....	5 “
“ “ Algebra .....	1 “		
“ “ Plane Geometry ...	1 “	Total .....	15 units

b. Drug store experience required for graduation.  
None.

## OREGON.

*Corvallis: Oregon Agricultural College, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education):  
Sixteen years. Two years in a high school.

b. Drug store experience required for graduation.  
None.

## PENNSYLVANIA.

*Philadelphia: Medico-Chirurgical College of Philadelphia, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).  
One year in a recognized high school, or equivalent education, certified by an authorized official of the State Department of Education.

b. Drug store experience required for graduation.  
Four years.

*Philadelphia: Philadelphia College of Pharmacy.*

a. Entrance requirements (age and preliminary education).  
Eighteen years of age and one year in a graded high school or its equivalent.

b. Drug store experience required for graduation.  
Four years or its equivalent.

*Philadelphia: The Temple University, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).  
Age seventeen, and one year in a recognized high school or its equivalent.

b. Drug store experience required for graduation.  
Four years.

---

\* Merged with Pittsburg College of Pharmacy, 1908-9.

Pittsburg: *Pittsburg College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).  
Age eighteen, and one year education in a standard high school, or its equivalent.
- b. Drug store experience required for graduation.  
Four years.

RHODE ISLAND.

Providence: *Rhode Island College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).  
No specific age. A certificate from a high school or reputable preparatory school, or examination.
- b. Drug store experience required for graduation.  
Three years.

SOUTH CAROLINA.

Charleston: *Medical College of the State of South Carolina, Department of Pharmacy.*

- a. Entrance requirements (age and preliminary education).  
Age twenty-one. A preliminary education satisfactory to the faculty.
- b. Drug store experience required for graduation.  
Four years.

SOUTH DAKOTA.

Brookings: *South Dakota State College of Agriculture and Mechanic Arts, Department of Pharmacy.*

- a. Entrance requirements (age and preliminary education).  
No age requirement. Scholarship requirement: three years in high school work, including one year of physics.
- b. Drug store experience required for graduation.  
None.

TENNESSEE.

Knoxville: *University of Tennessee, School of Pharmacy.*

- a. Entrance requirements (age and preliminary education).  
Two courses of instruction are offered: one, extending over two years, leads to the degree of Pharmaceutical Chemist (Ph. C.); and the other, extending over four years, leads to the degree of Bachelor of Science (B. S.).

The requirements for admission to the two year course are a knowledge of English grammar, physical geography (or physics, or geology, or agriculture), history of the United States, algebra to quadratics, and two books of plane geometry. For persons who have some knowledge of the drug business, or who are more than 21 years of age, these requirements may be modified.

The requirements for admission to the four year course are the same as those for the scientific and engineering courses. Students over 21 years of age will be admitted as specials, and may later become regular, and graduate by fulfilling all the requirements.

- b. Drug store experience required for graduation.  
None.

Nashville: *Vanderbilt University Department of Pharmacy.*

- a. Entrance requirements (age and preliminary education).  
Age, seventeen.

Students of this school who have passed in all the subjects of the junior year with not



more than two conditions are admitted as regular students. (Students are said to be conditioned on a subject when the grade is between forty-five and sixty per cent.)

Applicants who bring certificates of having passed in the studies of the junior year in any School of Pharmacy whose requirements for that year are, in opinion of this faculty, equivalent to those of this school.

Applicants who have received the degree of B. S. from any institution of learning of good standing, subject to the approval of the faculty.

Applicants with none of the above credentials are required to stand an examination in English and arithmetic, and three other subjects selected from the following list. The relative values of the subjects are indicated by the figures in parentheses:

English (4), Arithmetic (4), Algebra (to quadratics) (2), Elementary Latin (2), Plane Geometry (2), United States History (2), American Literature (2), Physical Geography (2), Elementary Physics (2), Physiology (2), Botany (2), Chemistry (2), a Modern Language (2). A diploma from a business college will be accepted in place of the arithmetic.

Those who pass on subjects with an aggregate value of twelve (12) are admitted, but will not be allowed to enter upon the work of the second year until the deficiency is made up.

On presenting certificates for admission prescribed above, or on passing examination in English and arithmetic, applicants are allowed to enter as irregular students and pursue such studies as they may select, provided that the faculty are satisfied of their honesty of purpose and consider them prepared to take the subject selected. This abatement in educational qualifications is made for the benefit of men of experience in pharmacy who are desirous of making up, as far as possible, deficiencies in scientific training.

b. Drug store experience required for graduation.

None.

*Nashville: Walden University, Meharry Pharmaceutical College (Colored.)*

a. Entrance requirements (age and preliminary education).

A good English education and an elementary knowledge of Latin.

b. Drug store experience required for graduation.

None.

*Sewanee: University of the South, Pharmacy Department.*

a. Entrance requirements (age and preliminary education).

Not under seventeen years of age for entrance; not under 21 for graduation. Must possess a recommendation from two physicians, attesting his fitness to enter upon the study, and the education required of a first grade teacher in public schools to be attested by the certificate of a superintendent of public instruction, or two years' high school work.

b. Drug store experience required for graduation.

Two years besides laboratory work while in college.

#### TEXAS.

*Dallas: Baylor University College of Medicine and Pharmacy.*

a. Entrance requirements (age and preliminary education.)

No report.

b. Drug store experience required for graduation.

No report.

Galveston: *University of Texas School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

To be at least 17 years old and if under 21, to present written consent of parents or guardian.

(1) Candidates are admitted without examination on presentation of (a) first grade teacher's certificate, (b) graduates of high school of Texas affiliated with University, (c) students who have been admitted to University of Texas, (d) to collegiate department of agriculture and mechanical college of Texas, (e) graduates of normal schools, (f) graduates of colleges in and outside of Texas whose curriculum corresponds to at least high school.

(2) Others must stand examination in the following:

Mathematics—Higher Arithmetic complete; Algebra through quadratics; Plane Geometry.

History—History of Texas; History of United States; Myers's Outlines of General History.

Geography—United States; General Geography; Physical Geography.

English—Candidate is required to write an essay of some 300 words on a subject assigned. He is graded in spelling, punctuation and grammar.

(3) Certificate of good moral character from two well-known and prominent men of his town. (Doctors, clergymen, judges, druggists).

b. Drug store experience required for graduation.

None.

Texarkana: *Gate City Medical College, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age 21 years. First grade teacher's certificate or equivalent.

b. Drug store experience required for graduation.

Two years.

VIRGINIA.

Richmond: *University College of Medicine, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Seventeen years of age. Good moral character. The completion of the common school course and, in addition, at least one year of high school studies.

b. Drug store experience required for graduation.

Four years for the degree of Ph. G., including time spent in college. None for the degree of Ph. B.

Richmond: *Virginia School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

No report.

b. Drug store experience required for graduation.

No report.

WASHINGTON.

Pullman: *State College of Washington, Department of Pharmacy.*

a. Entrance requirements (age and preliminary education).

At least sixteen years. For a two years' course the applicant for admission must have completed the eight grades of the public schools. He must also present 16 semesters' credits from the following list of high school subjects, one of which must be Elementary Latin: 3 credits in Algebra, 2 in Geometry, 1 in Higher Arithmetic, 4 in English, 4 in

Latin, 2 in German, 2 in French, 1 in Physical Geography, 1 in Physiology, 1 in Chemistry, 1 in Entomology, 2 in Horticulture, 2 in Agriculture, 2 in Physics, 1 in Wood-work, 1 in Drawing, 1 in U. S. History, 1 in Civics, 1 in English History, 2 in General History, 2 in Book-keeping. A semester is  $4\frac{1}{2}$  months' work in one subject, one hour recitation period.

We require the completion of four years' high school work for entrance to the *four year course*, and graduate with the degree of B. S. in Pharmacy.

b. Drug store experience required for graduation.

None.

Seattle: *University of Washington, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Age sixteen for all candidates for degrees, and graduation from an accredited high school (4 years).

"*Special students* who, by examination, can show themselves capable to carry the course may enter if over nineteen years of age."

b. Drug store experience required for graduation.

None.

#### WISCONSIN.

Madison: *University of Wisconsin, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

Graduation from a high school, or age eighteen years, and 1 year in a standard high school, the intermediate time having been spent in a drug store.

b. Drug store experience required for graduation.

None.

Milwaukee: *Marquette University, Pharmaceutical Department.*

a. Entrance requirements (age and preliminary education).

Age eighteen years. One year's attendance at a high school.

b. Drug store experience required for graduation.

None.

#### PHILIPPINE ISLANDS.

Manila: *University of St. Thomas, Pharmaceutical Faculty.*

a. Entrance requirements (age and preliminary education).

Fifteen years of age. It is necessary to have a degree of A. B. or a certificate showing that the applicant has passed such examinations as are required for the degree of A. B.

b. Drug store experience required for graduation.

Two years of practical experience in a drug store.

#### CANADA.

Montreal: *Laval University, School of Pharmacy.*

a. Entrance requirements (age and preliminary education).

A thorough education obtained in a classical college, or a satisfactory examination in French, English, Latin, mathematics, history and geography.

Students who have passed the preliminary examination of the Pharmaceutical Association of this province, which comprises the above subjects, are admitted on producing their certificates.

Students incapable of answering to above requirements are admitted to follow the

courses, but cannot compete for the diploma of the school. Instruction is given in French.

- b. Drug store experience required for graduation.  
Two years.

Montreal: *Montreal College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

No restriction as to age or education; payment of entrance and lecture fees is sufficient.

- b. Drug store experience required for graduation.

Four years' drug store experience is required to obtain the Provisional Board license to keep a drug store. To obtain the college diploma students must attend two six months' courses and pass the college examinations.

Toronto: *Ontario College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

Diploma not granted until 21 years of age, but must have matriculation for University prior to commencing apprenticeship.

- b. Drug store experience required for graduation.

Four years prior to entering the College, the Junior term of College counting as a part of the four years' apprenticeship.

Winnipeg, Manitoba: *Manitoba College of Pharmacy.*

- a. Entrance requirements (age and preliminary education).

A matriculant must present a Manitoba third class, non-professional teacher's certificate or something higher. This certificate is given on passing a satisfactory examination on courses of study in intermediate and high schools. It ranks somewhat below the full university matriculation, but many of our students possess standing higher than the third class non-professional. Age 21 is demanded for graduation.

- b. Drug store experience required for graduation.  
Four years.

## STATISTICS OF SCHOOLS OF PHARMACY.

## Total Hours of Obligatory Work.

Total Attendance 1907-1908.	Total number of Graduates 1907-1908.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work, Weekly.	a. Lecture.*	b. Laboratory.	c. Other.
36	10	ALABAMA:—Alabama Polytechnic Institute; Department of Pharmacy. Auburn. 2 yr. 72 4 yr. 144	2 yr. 34½ av. 4 yr. 36 av.	2 yr. 1080 4 yr. 2160	2 yr. 1404 4 yr. 3024	
13	5	Medical College of Alabama; Department of Pharmacy. Mobile. 48				
43	Phar. D. 1 } Ph. C. 11 }	CALIFORNIA:—California College of Pharmacy; University of California. San Francisco. Phar. D. 96 Ph. C. 64	24	Ph. B. 724 Ph. C. 704	Ph. B. 1680 Ph. C. 832	
17	7	College of Physicians and Surgeons of San Francisco; Department of Pharmacy. San Francisco. 64	24	928	608	
No report.	No report.	Southern California University; College of Pharmacy. Los Angeles. 52	24	524	724	
74	8	DISTRICT OF COLUMBIA:—George Washington University; National College of Pharmacy. Washington. 96	14	500	700	
50	Phar. D. 8	Howard University Pharmaceutical College. Washington. 90	18	800	1000	
		FLORIDA:—Florida College of Pharmacy. Jacksonville. Closed until further notice.				
19	9	GEORGIA:—University of Georgia; School of Pharmacy.† Athens. 72	25	762	783	
133	63	Atlanta College of Pharmacy. Atlanta. 52	33	741	730	104
25	8	Mercer University; School of Pharmacy. Macon. 64	25	785	815	
		* Lecture hours include Review and Quiz hours. † For Junior year only.				

\* Lecture hours include Review and Quiz hours.

† For Junior year only.

## STATISTICS OF SCHOOLS OF PHARMACY.—Continued.

				Total Hours of Obligatory Work.		
Total Attendance 1907-1908.	Total Number of Graduates 1907-1908.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work, Weekly.	a. Lecture.	b. Laboratory.	c. Other.
<i>Ferris Institute; Department of Pharmacy. Big Rapids.</i>						
120	4	72	25	Lecture and Recitation 720	1080	
<i>University of Michigan; School of Pharmacy. Ann Arbor.</i>						
102	Ph. C., 2 yrs. 18 B. S., 4 yrs. 10	2 yr. course 72 4 yr. course 144 Summer course, 8 weeks	34	1872	1728*	
MINNESOTA:— <i>University of Minnesota; College of Pharmacy. Minneapolis.</i>						
99	18	80	40	Lecture and Recitation 933	1488	
<i>Minnesota Institute of Pharmacy. Minneapolis.</i>						
The Minnesota Institute of Pharmacy is a private school for preparing druggists for state board examinations. There is no graduation from the school, and there are no age or educational requirements.						
MISSOURI:— <i>Kansas City College of Pharmacy and Natural Sciences. Kansas City.</i>						
80	22	64	Juniors 25 Seniors 20	640	992	
<i>Barnes College of Pharmacy. St. Louis.</i>						
32	11	62	Seniors 23 Juniors 22			
<i>St. Louis College of Pharmacy. St. Louis.</i>						
128	Ph. G. 34 Ph. B. 6 Ph. C. 2	60	23	550	780	
NEBRASKA:— <i>Creighton College of Pharmacy. Omaha.</i>						
110	53	48	32	720	860	
NEW JERSEY:— <i>New Jersey College of Pharmacy. Newark.</i>						
69	22	58	Juniors 11 Seniors 15½ * With additional for electives.	638	580	319

\* With additional for electives.

STATISTICS OF SCHOOLS OF PHARMACY—Continued.

Total Hours of Obligatory Work.

Total Attendance 1907-1908.	Total Number of Graduates 1907-1908.	Weeks of Instruction from Matriculation to Graduation	Hours of Obligatory Work Weekly.	a. Lecture.	b. Laboratory.
65	28	56	NEW YORK:— <i>Union University; Department of Pharmacy (Albany College of Pharmacy). Albany.</i>		
			Juniors 20	Lecture and Recitation 588	504
			Seniors 19		
140	61	74	<i>Brooklyn College of Pharmacy. Brooklyn.</i>		
			15	Lecture and Recitation 636	474
96	30	50	<i>Buffalo College of Pharmacy. Buffalo.</i>		
			20½	Lecture and Recitation 500	525
224	Ph. G. 75 Ph. C. 21 Phar. D. 3	56	<i>Columbia University; Department of Pharmacy (College of Pharmacy of the City of New York). New York City.</i>		
			20	700	420
47	10	70	NORTH CAROLINA:— <i>University of North Carolina; Department of Pharmacy. Chapel Hill.</i>		
			Juniors 14	614	660
			Seniors 27		
33	5	96	<i>Shaw University (Leonard College of Pharmacy). Raleigh.</i>		
			15	No report.	No report.
58	1	72	NORTH DAKOTA:— <i>North Dakota Agricultural College; Department of Pharmacy. Cass Co.</i>		
			30	Lecture and Recitation 1440	720
46	32		OHIO:— <i>Cincinnati College of Pharmacy. Cincinnati.</i>		
			30		
66	10	90	<i>Cleveland School of Pharmacy. Cleveland.</i>		
			1st year 11	Lecture and Recitation 570	585
			2d year 14		
			3d year 13½		
23	7	68	<i>Starling Ohio Medical University; Department of Pharmacy. Columbus.</i>		
			Seniors 21	600	710
			Juniors 26		

## STATISTICS OF SCHOOLS OF PHARMACY—Continued.

Total Hours of Obligatory Work.

Total Attendance 1907-1908.	Total Number of Graduates 1907-1908.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work Weekly.	a. Lecture.	b. Laboratory.	c. Other.
62	12	52	20	OHIO:— <i>Ohio Northern University; College of Pharmacy, Ada.</i>		
				About 390	About 620	130
75	18	Short Course 72 Long Course 144	30	<i>Ohio State University; College of Pharmacy, Columbus.</i>		
				Short Course 960 Long Course 1621	Short Course 1200 Long Course 2200	
50	21	Ph. G. 56 Ph. C. 76 Phar. D. 114	35	<i>Scio College of Pharmacy, Scio.*</i>		
				Ph. G. 800 Ph. C. 1100 Phar. D. 1800	Ph. G. 1000 Ph. C. 1400 Phar. D. 2000	
No report.				<i>Toledo College of Pharmacy, Toledo.</i>		
51	Ph. C. 9	Ph. C. 72 B. S. 144	Ph. C. 45 B. S. 45½	OKLAHOMA:— <i>University of Oklahoma; School of Pharmacy, Norman.</i>		
				Ph. C. 1296	Ph. C. 1728	Physical training. Ph. C. 108. B. S. 216.
80	19	144	22	OREGON:— <i>Oregon Agricultural College; Department of Pharmacy, Corvallis.</i>		
				1045	2123	
192	57	72	23½	PENNSYLVANIA:— <i>Medico-Chirurgical College of Philadelphia; Department of Pharmacy, Philadelphia.</i>		
				700	900	
472	140	79	17	<i>Philadelphia College of Pharmacy, Philadelphia.</i>		
				830	455	
215	76	Ph. G. 60 Phar. D. 90	Ph. G. Junior 18½ Ph. G. Senior 20	<i>Pittsburg College of Pharmacy, Pittsburg.</i>		
				Ph. G. 705 Phar. D. 720	Ph. G. 450 Phar. D. 1080	
			Phar. D. 20			
59	4	<i>The Temple College; Department of Pharmacy, Philadelphia.</i>				
		Day Course 74 Evening Course 111	Daily Course 18 Evening Course 12 and 15	600 730		
		* Merged with Pittsburg College of Pharmacy 1908-1909.				



STATISTICS OF SCHOOLS OF PHARMACY—Continued.				Total Hours of Obligatory Work.		
Total Attendance 1907-1908.	Total Number of Graduates 1907-1908.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work, Weekly.	a. Lecture.	b. Laboratory.	c. Other.
RHODE ISLAND:— <i>Rhode Island College of Pharmacy, Providence.</i>						
No report						
		SOUTH CAROLINA:— <i>Medical College of the State of South Carolina; Department of Pharmacy, Charleston.</i>				
54	18	56	18	About 416	About 390	
		SOUTH DAKOTA:— <i>South Dakota State College of Agriculture and Mechanic Arts; Department of Pharmacy, Brookings.</i>				
23	Ph. G., 4 B. S., 2	72	About 24	Lecture and Recitation 864	864	
		TENNESSEE:— <i>University of the South; Pharmacy Department, Sewanee.</i>				
16	6	48	24	660	680	120
		TEXAS:— <i>Walden University; Meharry Pharmaceutical College, Nashville.</i>				
66	6	78	25	Lecture and Recitation 780	1170	
		UNIVERSITY OF TENNESSEE:— <i>School of Pharmacy, Knoxville.</i>				
16	8	74	21	666	1036	
		VANDERBILT UNIVERSITY:— <i>Department of Pharmacy, Nashville.</i>				
55	11	72	72	About 825	About 1200	
		TEXAS:— <i>Baylor University; College of Medicine and Pharmacy, Dallas.</i>				
23	3	52	25½	250	910	
		UNIVERSITY OF TEXAS:— <i>School of Pharmacy, Galveston.</i>				
48	13	64	Junior 40 Senior 38	Junior 339 Senior 365	Junior 1107 Senior 1146	
		GATE CITY MEDICAL COLLEGE:— <i>School of Pharmacy, Texarkana.</i>				
No report						
		VIRGINIA:— <i>University College of Medicine; Department of Pharmacy, Richmond.</i>				
49	12	59	Junior 27½ Senior 24½	Lecture and Recitation 516	610	
No report						
		VIRGINIA SCHOOL OF PHARMACY:— <i>Richmond.</i>				

## STATISTICS OF SCHOOLS OF PHARMACY—Continued.

Total Hours of Obligatory Work.					
Total Attendance 1907-1908.	Total Number of Graduates 1907-1908.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work Weekly.		c. Other.
			a. Lecture.	b. Laboratory.	
<hr/>					
OHIO:— <i>Ohio Northern University; College of Pharmacy, Ada.</i>					
62	12	52	20	About 390	130
<i>Ohio State University; College of Pharmacy, Columbus.</i>					
75	18	Short Course 72	30	Short Course 960	Short Course 1200
		Long Course 144		Long Course 1621	Long Course 2200
<i>Scioto College of Pharmacy, Scioto.*</i>					
50	21	Ph. G. 56	35	Ph. G. 800	Ph. G. 1000
		Ph. C. 76		Ph. C. 1100	Ph. C. 1400
		Phar. D. 114		Phar. D. 1800	Phar. D. 2000
<i>Toledo College of Pharmacy, Toledo.</i>					
No report.					
OKLAHOMA:— <i>University of Oklahoma; School of Pharmacy, Norman.</i>					
51	Ph. C. 9	Ph. C. 72	Ph. C. 45	Ph. C. 1296	Ph. C. 1728
		B. S. 144	B. S. 45½		
OREGON:— <i>Oregon Agricultural College; Department of Pharmacy, Corvallis.</i>					
80	19	144	22	1045	2123
PENNSYLVANIA:— <i>Medico-Chirurgical College of Philadelphia; Department of Pharmacy, Philadelphia.</i>					
192	57	72	23½	700	900
<i>Philadelphia College of Pharmacy, Philadelphia.</i>					
472	140	79	17	830	455
<i>Pittsburg College of Pharmacy, Pittsburg.</i>					
215	76	Ph. G. 60	Ph. G. Junior 18½	Ph. G. 705	Ph. G. 450
		Phar. D. 90	Ph. G. Senior 20	Phar. D. 720	Phar. D. 1080
<i>Phar. D. 20</i>					
<i>The Temple College; Department of Pharmacy, Philadelphia.</i>					
59	4	Day Course 74	Daily Course 18	600	730
		Evening Course 111	Evening Course 12 and 15		
* Merged with Pittsburg College of Pharmacy 1908-1909.					

\* Merged with Pittsburg College of Pharmacy 1908-1909.

STATISTICS OF SCHOOLS OF PHARMACY—Continued.				Total Hours of Obligatory Work.			
Total Attendance 1907-1908.	Total Number of Graduates 1907-1908.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work, Weekly.	a. Lecture.	b. Laboratory.	c. Other.	
RHODE ISLAND:— <i>Rhode Island College of Pharmacy. Providence.</i>							
No report							
		SOUTH CAROLINA:— <i>Medical College of the State of South Carolina; Department of Pharmacy. Charleston.</i>					
54	18	56	18	About 416	About 390		
		SOUTH DAKOTA:— <i>South Dakota State College of Agriculture and Mechanic Arts; Department of Pharmacy. Brookings.</i>					
23	Ph. G., 4	Ph. G., 72	About 24	Lecture and Recitation 864	864		
	B. S., 2	B. S., 144					
		TENNESSEE:— <i>University of the South; Pharmacy Department. Sewanee.</i>					
16	6	48	24	660	680	120	
		<i>Walden University; Meharry Pharmaceutical College. Nashville.</i>					
66	6	78	25	Lecture and Recitation 780	1170		
		<i>University of Tennessee; School of Pharmacy. Knoxville.</i>					
16	8	74	21	666	1036		
		<i>Vanderbilt University; Department of Pharmacy. Nashville.</i>					
55	11	72	72	About 825	About 1200		
		TEXAS:— <i>Baylor University; College of Medicine and Pharmacy. Dallas.</i>					
23	3	52	25½	250	910		
		<i>University of Texas; School of Pharmacy. Galveston.</i>					
48	13	64	Junior 40 Senior 38	Junior 339 Senior 365	Junior 1107 Senior 1146		
		<i>Gate City Medical College; School of Pharmacy. Texarkana.</i>					
No report							
		VIRGINIA:— <i>University College of Medicine; Department of Pharmacy. Richmond.</i>					
49	12	59	Junior 27½ Senior 24½	Lecture and Recitation 516	610		
		<i>Virginia School of Pharmacy. Richmond.</i>					
No report							

STATISTICS OF SCHOOLS OF PHARMACY—Concluded. Total Hours of Obligatory Work.

Total Attendance 1907-1908.	Total Number of Graduates 1907-1908.	Weeks of Instruction from Matriculation to Graduation.	Hours of Obligatory Work, Weekly.	a. Lecture.	b. Laboratory.	c. Other.
WASHINGTON:— <i>State College of Washington; Department of Pharmacy, Pullman.</i>						
53	18	Ph. G. 72 B. S. in Pharmacy 144	36 36	864 2160	1728 for Ph. G. 2592 for B. S. in Pharmacy	Ph. G. Gym. 144 B. S. Gym. 216
<i>University of Washington; School of Pharmacy, Seattle.</i>						
61	21	Ph. C. 72 B. S. 144	Ph. C. not given B. S. not given	Ph. C. 648 B. S. 1314	Ph. C. 1368 B. S.*	Ph. G. Gym. 108 B. S. 216
WISCONSIN:— <i>University of Wisconsin; Course of Pharmacy, Madison.</i>						
35	Ph. G. 8 B. S. 3	Ph. G. 72 B. S. 144	No report.	Lecture and Recitation 755	1964	
<i>Marquette University; Pharmaceutical Department, Milwaukee.</i>						
66	10	60	35	1050	1050	
PHILIPPINES:— <i>University of Saint Thomas, Pharmaceutical Faculty, Manila, Philippines.</i>						
No report.	No report. (4 sessions of 9 months each.)	144	No report.	1st session 3 hours daily of lectures and laboratory practice. 2nd session 4 hours daily of lectures and laboratory practice. 3rd session 3 hours daily of lectures and laboratory practice. 4th session 2 hours daily of lectures and laboratory practice.		
CANADA:— <i>Manitoba College of Pharmacy, Winnipeg.</i>						
59	28	33	24	400	500	
<i>Laval University School of Pharmacy, Montreal, Canada.</i>						
67	3	52	225	225	125	
<i>Montreal College of Pharmacy, Montreal.</i>						
30	12	52	200	200	100	
<i>Ontario College of Pharmacy, Toronto.</i>						
101	91	30	44	600	600	

PHILIPPINE ISLANDS.—The University of St. Thomas, of the Philippine Islands, situated in Manila, was founded (Journal of the American Medical Association, 1906, 624), by a papal decree in 1587, and the medical school was added in 1871. The faculty consists of 19 professors. The course extends over a period of six years of nine months each. The first year is a preparatory one, devoted to the teaching of physics, chemistry and biology. The degree of licenciado is conferred at the conclusion of the fifth year, and the degree of doctorado at the end of the sixth year, during which only special work is done. The last year is optional, the degree of licenciado entitling the holder to all the rights and privileges of the holder of the degree of doctorado. The degree is equivalent to the English M. D. The Rector of the university is Dr. Fr. Kaymundo Velasquez; the Secretary of the medical department is Lic. Blas C. Alcaraz.

\* Variable on account of absences.

## BOARDS OF PHARMACY.

## 1. Please report :

(a) The number of applicants for registration as pharmacists, assistants and apprentices, respectively, in your state in 1907.

(b) The number registered and licensed in each class.

(c) The number examined and the number licensed without examination as graduates of pharmacy.

2. What was the total number of registered and licensed pharmacists (if licensed druggists constitute a separate class from the registered pharmacists under your law, state the number), registered assistant pharmacists, and registered apprentices in your state on December 31, 1907, or at the date nearest December 31, 1907, on which your records show these totals?

3. What is the total number of drug stores in your state?

## STATISTICS OF BOARDS OF PHARMACY.

Applicants in 1907		Registered in 1907		Registered without Examination.		Total Number Registered, 12-31-07		Total Number of Drug stores.	
Pharmacists.	Assistants.	Pharmacists.	Assistants.	Pharmacists.	Assistants.	Pharmacists.	Assistants.	Pharmacists.	Assistants.
ALABAMA.									
131	No report	116	No report	36	No report	1476	No report	No report	No report
ARIZONA.									
30	1	8	1	None	4	165	4	171	
ARKANSAS.*									
56		29		48		1540		400 (approx.)	
CALIFORNIA.									
No report									
COLORADO.									
Both 161		52	46	No report	32	848†		454 (approx.)	
CONNECTICUT.									
97	None	28	None	No report	None	1022	None	575 (approx.)	
DELAWARE.									
8	12	3	14	None	43	246		112	
DISTRICT OF COLUMBIA.									
47		27		4		570		200	
FLORIDA.									
No report		Both 100		79		1249	No report	No report	
GEORGIA.									
No report									
IDAHO.									
ILLINOIS.‡									
440	289	225	186	None		No report	No report	No report	No report

\* Will begin to issue assistant's licenses with the Nov., 1908, examination.

† July, 1906, to July, 1907.

‡ Apprentice applicants, 649. Apprentices registered, 54.

## STATISTICS OF BOARDS OF PHARMACY—Continued.

Applicants in 1907.		Registered in 1907.		Registered Without Examination.	Total Number Registered 12-31-07.		Total Number of Drug stores.
Pharmacists.	Assistants.	Pharmacists.	Assistants.		Pharmacists.	Assistants.	
INDIAN TERRITORY.							
No report.							
312	165	235	92	7	242	92	4100
INDIANA.							
IOWA.							
KANSAS.							
233	10	130	9	29	1756	No report.	No report.
KENTUCKY.							
No report.	No report.	57	No report.	None.	1706	No report.	800
LOUISIANA.							
About 80.	About 50.	43	28	None.	No report.	No report.	800 (approx.)
MAINE.							
131	6	28	2	None.	851	65	550 (approx.)
MARYLAND.							
60	24	21	18	None.	Both 1400.		550 (approx.)
MASSACHUSETTS.							
363	None.	113	None.	36	4807	None.	Not known.
MICHIGAN.							
No report.							

## STATISTICS OF BOARDS OF PHARMACY—Continued.

Applicants in 1907.		Registered in 1907.		Registered Without Examination.	Total Number Registered 12-30-07.		Total Number of Drug stores.
Pharmacists.	Assistants.	Pharmacists.	Assistants.		Pharmacists.	Assistants.	
MINNESOTA.							
No report.		48	55			1900	1000
MISSISSIPPI.							
No report.							
MISSOURI.*							
361		105		75	No report.	No report.	4200 (approx.)
MONTANA.							
No report.	No report.	No report.	No report.	None.	300	26	175
NEBRASKA.							
163	None.	No report.	None.	No report.	1706	None.	No report.
NEVADA.							
60	None.	54	None.	172	161	None.	Not known.
NEW HAMPSHIRE.†							
54	None.	16	None.		799	None.	No report.
NEW JERSEY.							
Both 508		106	43	1	2127	118	950 (approx.)
NEW MEXICO.							
Both 46		28	No report.	None.	172	No report.	Not known.
NEW YORK.							
289	87	255	70		No report.	No report.	4371
Apprentice certificates reg., 223							
NORTH CAROLINA.							
81	None	46	None.	20	719	45†	764 (approx.)
* June 1907 to June 1908. † Permits issued to Physicians to conduct drug stores in towns of less than 500.							

\* June 1907 to June 1908. † October 1906 to October 1907. ‡ Permits issued to Physicians to conduct drug stores in towns of less than 500.



## STATISTICS OF BOARDS OF PHARMACY—Continued.

Applicants in 1907.		Registered in 1907.		Registered Without Examination.		Total Number Registered 12-30-07.		Total Number of Drug stores.
Pharmacists.	Assistants.	Pharmacists.	Assistants.	Pharmacists.	Assistants.	Pharmacists.	Assistants.	
NORTH DAKOTA.								
Both 147		No report.	No report.	18		484	113	Not known.
OHIO.								
Both 363		114	75	7		3598	609	2500
OKLAHOMA.								
OREGON.*								
Both 143		50	26	4		727	73	Not known.
PENNSYLVANIA.								
234	526	118	219	None.		No report.	No report.	6240 (approx.)
RHODE ISLAND.								
4	34	3	23	None.		325	202	811†
SOUTH CAROLINA.								
45		30		None.		1042	None.	Not known.
SOUTH DAKOTA.								
Both 84		32	15	None.		652	39	Not known.
TENNESSEE.								
79	92	39	125	None.		1158	277	388†
TEXAS.								
Both 65		22	6	No report.		3560†	No report.	No report.
UTAH.								
Both 42		26	9	None.		No report.	No report.	135

\* For year ending May 25, 1908.  
† 877 permits issued to physicians in towns less than 1000.

\* For year ending May 25, 1908.

† Figure given in 1906.

† 877 permits issued to physicians in towns less than 1000.

STATISTICS OF BOARDS OF PHARMACY—*Concluded.*

Applicants in 1907.		Registered in 1907.		Registered Without Examination.	Total Number Registered, 12-31-07.		Total Number of Drug stores.
Pharmacists.	Assistants.	Pharmacists.	Assistants.		Pharmacists.	Assistants.	
VERMONT.							
29	None.	7	None.	None.	370	None.	175*
VIRGINIA.							
118	30	30	30	None.	831	111	Not known.
WASHINGTON.*							
152		92	3				
WEST VIRGINIA.							
87	4	66	2	28	570	2	350 (approx.)
WISCONSIN.							
89	58	50	49	None.	1727	452	960 (approx.)
WYOMING.							
No report.							

\* Figure given in 1906.

No report.

## STATE ASSOCIATIONS.

A letter was sent to each State Association asking for information concerning new and proposed legislation affecting pharmacists, enacted during the year 1907.

## ALABAMA.

No new legislative enactments since last year's report.

## ARKANSAS.

The law enacted in 1907, which was essentially a copy of the national Food and Drugs Act, went into effect January 1, 1908.

## CALIFORNIA.

A pure drugs law was approved March 11, 1907, which follows closely along the lines of the national Food and Drugs Act in its reference to drugs. The enforcement of this Act, however, is not in the hands of the Pharmacy Board, but in those of the State Board of Health.

## COLORADO.

An Act approved April 18, 1908, provides for the creation of a Board of Pharmacy and the regulation and practice of the profession of pharmacy, including the licensing of persons to carry on the same and their exemption from jury duty. Applicants for registration must have had four years' practical experience in compounding and dispensing physicians' prescriptions, and must show evidence of an education equivalent to the course prescribed by a grammar school. The registration of apprentices is provided for. Merchants in towns having less than 500 population, in which there is no licensed pharmacist, are permitted to sell or vend such medicines, compounds or chemicals as are required by the general public, with the exception of a number of substances specified in the Act, which include the powerful narcotic, mineral and irritant poisons and abortifacients. The proper registration of poisons is also provided for.

## CONNECTICUT.

A law was enacted corresponding to the national Food and Drugs Act in its provisions which went into effect January 1, 1908. The ruling of the Dairy and Food Commissioner of this State exempted drugs sold under the names recognized by the U. S. P. and N. F. from statements as to the percentage of alcohol contained in them or any drug contained in them, provided such articles conform to the formulas by which they are supposed to be made.

## DISTRICT OF COLUMBIA.

No report.

## FLORIDA.

There has been no change in the pharmacy laws, but a new law is now being drafted which will be presented to the Legislature at its next meeting.

No account of the provisions of this law was sent.

## GEORGIA.

No report.

## IDAHO.

The only change in the pharmacy law for this State is an amendment restricting the sale of cocaine. This amendment absolutely prohibits the furnishing of this drug to habitues, even upon physicians' prescriptions.

## INDIANA.

No report.

## INDIAN TERRITORY.

No report.

## IOWA.

No report.

## KANSAS.

No report.

## KENTUCKY.

No new legislative enactment during 1907.

## MAINE.

A law similar to the national Food and Drugs Act was passed, which exempts physicians' prescriptions from the provisions on labeling. The enforcement of this law is in the hands of the Pharmacy Board, and this body is permitted to draw on the funds in the treasury of the Board for official work.

## MARYLAND.

No new legislation was passed affecting the pharmacists of the State, but a special cocaine law was passed applying to Baltimore City alone, in which the regulation is placed in the hands of the police authorities to enable them to break up the traffic by persons not connected with the drug trade.

## MICHIGAN.

No new legislative enactments since last year's report.

## MINNESOTA.

No new legislative enactments since last year's report.

## MISSISSIPPI.

The only legislation enacted in this state during 1907 affecting pharmacists was a prohibition law, which is somewhat contradictory in its provisions in that it provides that druggists can handle alcohol under certain conditions, and in another paragraph states that the names of those persons having internal revenue licenses will be published in all of the county papers, and the holding of said license will be *prima facie* evidence of guilt. This places the druggist in a position where he must have a government license to comply with one part of the Act, and yet the possession of said license is accepted by the State as a violation of the law.

## MISSOURI.

No new legislative enactments since last year's report.

## NEVADA.

No new legislative enactments since last year's report.

## NEW HAMPSHIRE.

No new legislative enactments since last year's report.

## NEW JERSEY.

A law very similar in its provisions to the U. S. Food and Drugs Act was passed, to take effect October 1, 1908. It excepts the official preparations of opium, iodine, camphor, ginger and peppermint, from the substances which are allowed to deviate in strength from the official standards, provided such deviation is plainly and correctly stated on the label.

## NEW MEXICO.

The new State pharmacy law provides for the registration of only such persons as are at least 21 years of age and who have attended a high school for at least one full school year. A registration fee of \$3 is collected annually, and failure or refusal to pay the renewal fee within 60 days after the first of May results in revocation of the license, which can only be re-obtained by re-examination of the candidate. If any registered pharmacist shall go out of the drug business for a period of 12 months, his certificate as registered pharmacist shall thereupon expire and he shall not be re-instated without examination. All penalties collected under the provisions of the Act are turned into the expense fund of the Board of Pharmacy, and the Board has power to revoke the certificate of any registered pharmacist upon satisfactory evidence that the said pharmacist is addicted to the use of narcotic drugs or is an habitual drunkard.

## NEW YORK.

A bill similar to the national Food and Drugs Act was presented to the Legislature but was vetoed by the Governor because the Anti-Narcotic League opposed it. A bill which passed the Legislature and became a law was one permitting the wholesale houses to sell cocaine to each other under drastic restrictions in the ordinary course of daily business. Three or four other bills were presented and defeated, one of which required that the ingredients of each prescription or compound should be fully stated upon the label of the container, and another required that all prescriptions written by physicians should be written in the English language, and that no patent proprietary medicines should be prescribed.

## NORTH CAROLINA.

No new legislation affecting pharmacists was enacted in this State during 1907 except the elimination of the word "saccharin" from the Food and Drugs Act. The Board of Pharmacy was given authority to define and designate non-poisonous and domestic remedies.

## OHIO.

A bill similar in its provisions to the Federal Food and Drugs Act was passed, which was to take effect on July 1st, 1908. Several other specific laws were enacted to take effect during 1908 or 1909, including a linseed oil law and a vinegar law and a paint law.

## OKLAHOMA.

A law was presented to the State Legislature, drafted along the lines of the Beal Model Pharmacy Law. The Legislature, however, adjourned without taking final action on the bill. Another law corresponding to the National Food and Drugs Act was introduced and was also defeated.

## PENNSYLVANIA.

No new legislation was enacted since last year's report, although several bills were presented, the most noteworthy of which was one providing that all poisonous liquids should be dispensed in triangular bottles.

## SOUTH DAKOTA.

No new legislative enactments since last year's report. The Pure Food and Drug Law, which was in force, was declared void as applied to pharmacists by the Supreme Court of the State, on account of the indefinite phraseology of the Act. The Board of Pharmacy of this State now requires three years' high school standard as a prerequisite for examination for registration.

## TENNESSEE.

No new legislative enactments since last year's report.

## TEXAS.

No new legislative enactments since last year's report.

## UTAH.

No new legislative enactments since last year's report.

## VERMONT.

No new legislative enactments since last year's report.

## VIRGINIA.

An Act approved March 14, 1908, was passed, providing for the regulation of the practice of pharmacy, in which many of the good features of the National Food and Drugs Act were included. It is particularly stringent as regards the registration of poisons and the restrictions placed upon the sale of narcotic drugs, such as opium and coca, and their preparations and alkaloids. The enforcement of this law has been placed in the hands of the State Pharmacy Board.

## WEST VIRGINIA.

An act which went into effect January 1, 1908, was passed, regulating the practice of pharmacy and creating a board of pharmacy, which shall consist of one voter from each congressional district of the State actively engaged in the practice of pharmacy, appointed by the Governor, with the approval of the Senate. Annual reports are required from the Board of Pharmacy to the Secretary of State of the Commonwealth. Four year's practical experience in pharmacy, under the instruction of a licensed pharmacist are required of applicants for registration as manager.

In the case of a person who has attended a reputable school or college of pharmacy, the actual time of attending such school or college may be deducted from the time of experience required, but in no case shall less than two years' experience be required for registration. Re-registration is required every two years, and the fee of one dollar is collected. Reciprocal registration is also provided if the standard of competence required in the State from which the applicant holds his certificate is not lower than is required in West Virginia, and provided also that such other State accords similar recognition to the licentiates of West Virginia. Stringent restrictions were placed about the sale of narcotic and poisonous drugs; in case of a second conviction under the Act, the license of the offending pharmacist is revoked.

## WISCONSIN.

An amendment to the pharmacy law particularly applying to the sale of narcotic drugs and poisons and granting permits to dealers in rural districts was passed in 1907. This Act also prohibits the scattering of samples of medicines from house to house.

## SUMMARY.

*Schools of Pharmacy.*

The following summary of data obtained by your secretary from schools of pharmacy is of interest.

Maximum number of students.....	472
Minimum number of students..	10
Maximum number of graduates .....	140
Minimum number of graduates.....	1
Maximum weeks of instruction.....	144
Minimum weeks of instruction .....	30
Maximum hours of lecture work .....	3,012
Minimum hours of lecture work .....	200
Maximum hours of laboratory work.....	3,024
Minimum hours of laboratory work.....	100

In the foregoing table as applied to colleges of pharmacy, the total number of hours of obligatory work and total number of weeks of instruction are given as submitted by the various institutions, without any special reference to the time taken out for holidays and examinations. This point should be covered and the differentiation made in subsequent annual reports. It was not possible to do so this year as this deficiency was pointed out to the secretary too late to send another letter asking for additional information. The replies to the first letter sent out were not very prompt, and in some instances it was necessary to write three in order to obtain even a partial and incomplete report, and in other cases no replies whatever were given.

The general trend of the times, as shown by the changes in age, experience and entrance requirements and the hours of obligatory work, is to make the study of pharmacy more difficult by increasing the requirements for admission and lengthening the course for graduation. That this has not proved a deterrent to the American youths who hope to win fame and fortune in the profession of pharmacy is shown by the fact that the number of students has slightly increased since the previous year's report, the figures being 4,212 for 1906 as against 4,391 for 1907, according to the statistics submitted by those institutions from whom reports were received for both years. Adding to this more than 700 who are reported in attendance at those institutions from whom figures for one year only were obtainable, it brings the total number of students in pharmacy to well above 5,000, of whom between one and two thousand graduate annually (1,553, according to this year's report).

The increasing importance of food and drug legislation has placed added responsibilities upon the shoulders of the pharmacist, and the more prominent colleges are recognizing this fact by offering courses especially adapted to fit men for work along this particular line, the demand for trained pharmacists during 1907, for analytical positions particularly, being far in excess of the available supply.

#### *Boards of Pharmacy.*

In this year's report the column for the total number of applicants examined was omitted, as this figure may be obtained by adding together the figures of the foregoing columns. A comparison of last year's figures with those of this year, as regards the number of persons registered, shows that there is a slight increase, the number for 1906 being 1765 as against 1809 for 1907. These figures were taken from the reports of those States heard from in both years. Adding to this year's figures over 900, the number registered in the States from whom figures for 1907 were not obtained, it brings the total registration to nearly 3000, which does not seem to explain the apparent dearth of registered clerks which is reported from some sections of the country.

Some difficulty was experienced in obtaining comparable figures from the State Boards, as there seems to be a diversity of methods of expressing the information given, and some factors were not obtainable at all in certain cases.

#### *State Associations.*

Underlying all of the reports of new and proposed legislation is the influence of the national Food and Drugs Act of June 30, 1906. Attention was called in last year's report by the Secretary, to a large number of States in which the influence of the Food and Drugs Act was being shown by actual or proposed legislation. In many States the administration of the law, as applied to drugs, has been placed either entirely in the hands of the pharmacy board or pharmacists have obtained representation upon the board in whose hands is placed the enforcement of the Act. Among the most important of the new legislative enactments will be found those applying to the sale of narcotics, especially cocaine, the widespread and increasing use of this drug having attracted public attention to an extent heretofore unnoticed.

CHARLES H. LAWALL, *Secretary.*

On motion of Mr. Hays, of New York, the report of the Secretary was ordered received, to take the usual course.

The Chair stated that the next order of the program was an address on the opium question, by Dr. Hamilton Wright, Acting Chairman of the United States on the International Opium Commission, whose meeting is to be held at Shanghai, China, next January. He said Dr. Wright had written a letter to the President of the Association on August 10th, stating that he would certainly be present if possible, and if not, he would send a statement as to the status of the opium question in this country at the present time. But on August 27th he had written again stating that it did not seem possible for him to attend the meeting at Hot Springs, but he would take pleasure in addressing a letter on the subject of Opium in the United States and the object of the International Opium Commission, which he would be glad to have brought to the attention of the Association. The Chair stated that the letter in question had not arrived however, and that matter would have to be laid over for the present.

The Chair then called for a paper on The Importation of Opium, by Mr. Henry P. Hynson, of Baltimore.

Mr. Hynson said that his paper was intended simply to be supplementary to the paper of Dr. Wright. He then proceeded to explain some of the work he had done in connection with the policy of the public press in Baltimore to publish health bulletins in the Sunday papers upon such subjects as Lockjaw, Food of Infants, Typhoid, etc., and stated that he had used some of the data thus collected in this paper. He then proceeded to read his paper as follows :

#### IMPORTATION OF OPIUM, COCA AND THEIR CHIEF ALKALOIDS.

HENRY P. HYNSON, BALTIMORE.

Because of the fact that all of these drugs, either in crude form or as separated alkaloids, used in this country are imported, these figures may be relied upon to throw light upon existing conditions.

The tabulation submitted by the Committee on the Acquirement of the Drug Habit in 1902, is here reproduced with more complete totals and a similar arrangement for the succeeding five years is offered for the additional facts it carries and also for the purpose of comparison. The diagram is graphic and needs no comment to make it variously interesting and instructive.

All these figures were generously supplied by our efficient Bureau of Statistics at Washington, through the courtesy of the Chief and Acting Chief. Of course, the quantity reports are more reliable, but, unfortunately, these apply to the importations of opium and morphine only. Values are not so helpful in showing exact changes, excepting when one acquaints himself with the current prices during the several periods.



## IMPORTATIONS FOR CONSUMPTION.

FISCAL YEARS.	Quantities.			Values.						
	Opium Medicinal.	Opium Smoking.	Morphia and Salts.	Opium Medicinal.	Opium Smoking.	Morphia and Salts.	Coca Leaves.	Cocaine and Salts.	Opium and Morphia.	Coca and Cocaine.
	Lbs.	Lbs.	Oz.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
1898 .....	72,287	117,298	25,791	162,652	791,379	35,659	53,752	59,660	989,690	113,412
1899 .....	343,283	127,082	13,081	833,751	837,456	35,357	28,388	40,141	1,706,564	68,529
1900 .....	537,004	129,336	26,208	1,137,762	938,524	75,274	591	112,375	2,151,560	112,966
1901 .....	491,448	139,519	50,819	1,030,209	1,141,518	147,517	483	176,948	2,319,234	177,421
1902 .....	548,674	163,442	38,002	1,263,369	1,190,493	96,259	.....	254,704	2,549,421	254,704
First 5 years .....	1,992,696	676,677	153,901	4,427,743	4,899,370	390,366	83,214	643,168	9,716,469	727,032
1903 .....	486,614	182,629	12,371	972,587	1,132,182	25,717	249,798	224,453	2,131,486	474,251
1904 .....	535,048	164,611	20,763	1,165,385	1,191,055	43,766	323,405	74,446	2,400,206	397,851
1905 .....	456,564	144,997	21,391	913,770	1,316,096	41,734	342,318	10,391	2,271,240	352,909
1906 .....	514,424	139,106	24,041	1,207,856	1,395,283	47,938	488,545	10,782	2,561,077	499,327
1907 .....	444,121	151,916	27,608	1,134,681	1,460,400	55,090	212,424	37,585	2,650,171	259,009
Second 5 years .....	2,436,771	783,259	106,174	5,394,279	6,406,016	214,245	1,616,690	357,657	12,014,180	1,983,347

No matter how these figures may be viewed or how they may be modified, it will not be possible to find much encouragement in them, for those of us who hoped the active legislative and punitive campaign of the last five years would cure the abuse of these drugs; there is certainly nothing in the figures to lead us to rest our oars, but everything to induce us to increase and make more varied our activities. There seems to be great need for the adoption of other means than those already tried to prevent and counteract the growing evil.

Correspondence with importers and with manufacturers of alkaloids impresses us with the sincerity of those with whom we come in contact and who are known as honorable concerns. These all believe and, so far as their own trade is concerned, have proof to show that the sale of these drugs, especially cocaine, has decreased. It is believed that this is true with the leading dealers and producers, but the government figures flatly deny such a condition and plainly suggest the probability of the existence of dishonorable and secretive sources of supply, not known to honorable members of our profession. It may be that the Marine Hospital and Public Health Service might secure data from the United States Custom Service which, if published, would enable the states to discover who it is that promotes the sale of these narcotics.

Of no small interest is the changing conditions regarding the production of alkaloids in this country, which may be plainly traced throughout the figures.

No one should be discouraged by such facts as these; no one who finds the development and uplifting of humanity to be the most inspiring and soul-satisfying work, should be discouraged; rather would they lead them to more earnestly seek and teach the truth. Let us first try to answer the questions: "Why does the world so violently crave stimulants? Why does it need them?" With these fully answered, we might take more effective subsequent steps.

Mr. Hynson added that the principal value of his paper would be its publication in this form, so it could be used for purposes of comparison by those interested in the subject.

Mr. Hallberg, of Chicago, asked if there was any reference to crude mixtures of alkaloid that might be imported from South America under the name of Coca. He said he suspected that the customs officers had been permitting this, which would account for the manufacture of cocaine in the United States.

Mr. Hynson said he did not know about this, but was glad to have the suggestion, as it had not occurred to him.

Mr. Kebler, discussing the paper at the invitation of the Chair, said he supposed there were but few persons present who did not believe that opium, morphine, and cocaine were valuable agents in the treatment of

disease—especially morphine, for which there was no substitute in cases of excruciating pain. As to cocaine, while it is a valuable agent, there are other similar agents just as useful in medicine, though no one can tell the extent to which they may be used in the future.

This question of the importation of opium, cocaine and these other alkaloids associated with these products, is one that has received considerable attention at the hands of the Government. As Mr. Hallberg has intimated, some of these things are undoubtedly imported under names from which their presence would hardly be suspected, and this is especially true of opium, morphine and cocaine. Their presence has been discovered by the Government officials in many of these imported products, and many others doubtless get through without discovery. Crude cocaine is imported to quite a considerable extent, and is used quite largely by a number of manufacturers in the preparation of their purified products. But this is all properly taken care of by the customs officers, and a close record of it is kept; and so this class of importations is probably included in the figures given in the report of Mr. Hynson.

Many of these foreign products are brought into the United States surreptitiously, and the customs officers do not catch them. In one port, where strict examination is not had, they may come in, when they could not do so through the port of New York. He made some concrete illustrations to prove this. For instance, attempts are made to import adulterated, mixed drugs under such nondescript names as roots, leaves, etc. Belladonna, mixed with poke root, is an example. But in all such cases the Government holds that, irrespective of the name under which a drug is imported, it is the thing itself which controls, and such drugs will not be allowed to come into the country under the general name of "Roots."

All sorts of devices are resorted to to evade the law in the surreptitious introduction of cocaine and such other products from one State to another. For example, porters on railroad trains secretly bring cocaine into the District of Columbia from New York and Jersey City. He told of the evil effects of cocaine on the negroes of the South, sometimes making them absolutely crazy, according to credible authority. He told, also, a story in his own experience in a barber shop in Washington City recently, where he encountered a victim of the cocaine habit in the person of one of the barbers, who, when asked how it affected him, said that a good, big dose of it made him feel mighty good at first, but afterwards, when he would be shaving a man, the thought would keep running through his head constantly, "Cut his damn throat! Cut his damn throat!"

Another abuse of this sort is the secret use of cocaine in certain infants' teething syrups, which is additional proof of the insidious manner in which cocaine has been permeating all classes and being introduced into every walk in life. "Is it any wonder," Mr. Kebler said, "that we have the cocaine trouble in this country when it begins with the cradle?" Only a

strong prohibitive sentiment can bring this evil to a halt through prohibitive legislation. He commended the efforts of the National Association of Retail Druggists through a bill introduced into Congress, to stop this increasing evil, and expressed the hope that this Association would put itself on record as favoring such restrictive legislation. The substance of this bill is that no such substance shall be shipped as Interstate Commerce through the mails, by express, or in any other way direct to the consumer except on physicians' prescriptions. It means simply this: If a doctor wants cocaine, morphine, hydrated chloral or any such agent in the treatment of his patients, he can get it; but he must put himself on record, and not prescribe it secretly. Mr. Kebler, continuing, said he had been informed that in anticipation of the passage of such a law the doctors in certain cities are buying morphine tablets by the thousands and hundreds of thousands, and the conclusion is obvious, that they do not want to go on record in this matter of writing prescriptions for morphine.

Mr. Mason asked Mr. Kebler for more specific information about the N. A. R. D. bill referred to, as to whether it was a bill drawn up by the N. A. R. D., and approved at its last meeting, and introduced into Congress, or whether it was still another bill. Also whether the bill referred to permits interstate shipment of these drugs by wholesalers in one State to retailers in another State.

Mr. Kebler said he did not know exactly what they had approved at the last meeting of the N. A. R. D., but the regular channels of trade were not interfered with by the bill in question. Any recognized shipper of these goods can ship wherever he pleases, but not to a consumer, or peddler or individual.

Mr. Payne was reminded by the remarks of Mr. Kebler that cocaine does not always have the sinister effects on its devotees described by him, as illustrated in the case of a Georgia darkey, who said it made him "feel like a retired banker, and like he owned the whole city of Atlanta." That was an instance of its amiable effect.

Mr. Hallberg, in this connection, offered the following resolution:

WHEREAS, The importation of coca and its alkaloids and derivatives can be controlled through the Customs Service;

*Resolved*, That, in the opinion of the American Pharmaceutical Association, every importation of coca, its alkaloids and derivatives should be registered at the port of entry, and also that the Treasury Department, or some other department of the Federal Government, should keep an accurate record of the sale and disposition of these substances, and make regular report.

The Chair stated that it might be well to read here section four of the Report of the Committee on President's Address, which was referred to this Section, which seemed to bear somewhat on this subject. He thereupon read the section, as follows:

With reference to the elimination of retail druggists who sell drugs for illegitimate use (cocaine, whiskey, etc.), as noted by President Searby, we most strongly condemn such practices, and urge that special steps be taken or inaugurated by our Association to drive all these out of the retail drug business. They are not honest pharmacists; they are only masquerading as such, to the detriment of higher pharmacy and the injury of honest pharmacists.

Mr. Kebler thought that if Dr. Wright were here he could elucidate this point very thoroughly. He, himself, was quite conversant with the situation, but hardly thought it his province to say anything about his work. At the last session of Congress a bill was introduced by one of the senators from Vermont which had exactly this point in view. The attempt has been made to control by a commission appointed by the President—a commission of three members. Dr. Wright is now investigating the situation and collecting data for the purpose of properly putting this thing in shape; and the idea is to include in that legislation the cocaine evil as well. Where the work is being done at present is in the State department. The Secretary of State has become very much interested in this matter, and is pushing it actively. This resolution cannot do any harm; it simply presents the sentiment of the Association.

Mr. Hallberg said that, to his mind, this question was a very simple one; that there was no need of any commission. It is the old story of Columbus and the egg. There are only three or four ports of entry in the United States which have coca importations, and it is the business of these customs officers to keep a record of it and to report where it goes to.

The Chair then re-read the Hallberg resolution, as amended by Mr. Searby, and put it to a vote, and it was adopted.

Mr. Hynson said that Dr. Wright had called on him in Baltimore in regard to this opium question, and that the information or data that the American Pharmaceutical Association had gathered on this subject was the basis of Dr. Wright's own action in the premises.

The Chair called on Mr. Mason to read his paper entitled "Pharmacy Facing a Crisis," which he presented as follows:

#### PHARMACY FACING A CRISIS.

BY HARRY B. MASON.

I do not covet the reputation of an alarmist. I have no desire to be considered a radical. But I am convinced by special observation lasting throughout several years that a great danger to pharmacy is stealing upon us more or less unawares, and that unless we make earnest preparation to meet it manfully and honestly we shall some day awake from our dream of indifference to find our reputations hanging in the balance. These are strong words but they do not overstate the probabilities. In writing them I have in mind the crisis indirectly presented to pharmacy by the onward success and development of the temperance movement.

## SCOPE AND SUCCESS OF THE TEMPERANCE MOVEMENT.

Do you realize what this movement means—what success it has already attained? Let me give a few eloquent facts:

That Maine and Kansas have long been prohibition States is generally known, and that North Dakota also adopted prohibition some years ago is also matter of common knowledge. During the last year or two, however, Georgia, Oklahoma, Alabama, Mississippi, and North Carolina have in rapid succession joined the ranks, so that eight States are now standing solid for prohibition. But of far more significance is the spread of the local-option movement—and local-option, it may be observed in passing, is a more rational method of solving the liquor problem than State prohibition, for it means that only those communities will be “dry” in which public sentiment stands behind the mandate and gives it that support by which only laws can be properly respected and enforced.

Local option has spread itself over the country during the last few years with a sweep which suggests the onward progress of a great tidal wave. Whereas the 8 prohibition States contain 10,000,000 or 11,000,000 people, the towns and counties in other States which have outlawed the saloon under local option laws have a total population of something like 26,000,000, or 28,000,000. Altogether, therefore, nearly half the entire population of the United States is already living in “dry” communities. *Even more surprising is the geographical fact that over two-thirds of the area of the country is now “dry.”* The movement has reached its greatest height in the Southern States, where 17,000,000 out of the 20,000,000 people there residing have eliminated the saloon in no uncertain manner.

In 1900 there were 18,000,000 people living in the United States under prohibition laws of one sort or another. The present conditions, therefore, have largely developed since that time, and far from spending itself the tidal wave is steadily gaining power and sweep as it advances. During 1907 three million people abolished the saloon under local option laws, not to mention the States which enacted prohibition measures. Of the thirty-four legislatures in session last winter, twenty adopted statutes against the liquor traffic, and no fewer than twenty bills were introduced in Congress. That practically every legislature, and Congress as well, will next winter have before it measures of one sort or another seems a certainty.

The mistake must not be made of assuming that this movement is tied up to the skirts of the so-called Prohibition Party and is in any sense dependent upon its successes or failures. It is a great social, moral, economic force which has no organic connection with any political party. Nor is it limited to the United States. We shall get a better idea of its strength and permanence if we realize that it is virtually world-wide in scope and extent. It is making itself felt in England, France, Sweden, Finland, Russia, Switzerland, Belgium, and to a lesser extent in Germany

also. Over our own borders in Canada we find that in Nova Scotia sixteen out of eighteen counties are "dry" under local option; that in New Brunswick all but five counties are "dry;" that Prince Edward Island has extirpated the saloon from end to end; and that temperance has also made much progress in both Ontario and Manitoba.

From these facts it is clear that a great world-force is exerting itself in our Western civilization. That the tide will ebb and flow I have no doubt. That it will alternately recede and advance would be predicted by any careful student of history. Human progress never moves in a straight line; it tacks from right to left like a sailboat, still advancing slowly but frequently suffering the current of public thought or indifference to carry it down the stream. That, however, this great social and moral power will continue in operation, and that it will have to be reckoned with all over the world in the generations to come, I have no doubt.

#### THE SECRET OF ITS STRENGTH AND PERMANENCE.

And where, it may well be asked, does it draw its strength? From the deepening and widening conviction so well expressed by the United States Supreme Court when it declared that "the public health, the public morals, and the public safety are endangered by the general use of intoxicating liquors," and that "the idleness, disorder, pauperism, and crime existing in this country are largely traceable to this evil." This sums up the issue in a single sentence.

The liquor interests protest that the temperance movement is an attack upon the individual liberty which this country stands for as one of its vital principles. But modern society realizes that its first duty is to protect itself, and that individual liberty must be curbed when it endangers the public liberty and the public welfare. Men as a class and not men as individuals must be the primary and supreme consideration if the greatest good to all is to be achieved, and if the race is to be protected from the cancerous growths which attack its very vitals.

Hence we have boards of health to see that sanitation is observed in the interests of the public health. We have laws against diseased meat, impure milk, and adulterated foods and drugs. We have statutes restricting the sale of dangerous narcotics like cocaine, morphine and opium. We have in some States limited the sale of gun-powder and dynamite. We have recently undertaken to protect the public from harmful patent medicines. We have enacted city ordinances against expectoration in public places. These and other things we have done from a realization that one of the first needs of society is the obtainment of public health, public morals, and public security. The temperance movement has sprung from the same fundamental consideration. It is part and parcel of a general world-wide movement which, though it may suffer temporary defeats, will not perish from the earth.

Is it doubted that society has adequate reason for its sternness? Is it questioned that general liquor drinking is a great social evil? Careful statistics gathered in Europe over a period of 25 years show that of a total of 30,000 prisoners 41 per cent of them committed their crimes under the influence of alcohol. The inspector of prisons in Switzerland reported 41 per cent. of the men as drunkards and 31 per cent. of the women. In France the influence of alcoholism on crime is stated to be 59 per cent., while an elaborate investigation made during 1895 in Massachusetts resulted in the discovery that 82 per cent. of convicted persons were under the influence of liquor at the time their offenses were committed. Pauperism is equally the result of uncurbed liquor drinking, and the percentage of paupers addicted to the habit has been variously found to range from 50 to 80 per cent. Economic inefficiency is another result quite as marked, but it scarcely lends itself to statement in the form of statistical figures.

How these evils are remedied by outlawing the saloon has been well shown in the United States during the last few years. In the city of Atlanta the courts are doing 50 per cent. less business than they were a year or two ago. In the town of Commerce, Georgia, the cases in the municipal court have fallen off 75 per cent. In Brunswick the arrests for disorderly conduct have been reduced 50 to 75 per cent. In Birmingham general crime has been reduced 60 per cent. and drunkenness 85 per cent. In Kansas City, Kansas, where the State prohibition law has been enforced during the last two years, bank deposits have increased 35 per cent., 500 new homes have been built, foreclosure suits have become far less numerous, great activity in the building of churches has been experienced, instances of poverty have decreased in number despite the recent industrial depression, and the records show fewer cases on the court dockets than have been known for years. It has been generally discovered, indeed, that whenever prohibition or local-option laws have had the support of public sentiment, and have consequently been enforced, crime, idleness, and pauperism have been greatly decreased on the one hand, and on the other there has been a great increase in thrift, domestic happiness, religion, and social and economic efficiency.

#### THE WRITER'S ATTITUDE.

From what I have written in the foregoing it might perhaps be assumed that I am personally a rabid prohibitionist. Far from it. I have not chosen to write as an advocate. My attitude thus far has simply been that of a reporter and interpreter of facts which tell their own story. I am not a "teetotaler" in personal practice. While I do not care for liquor I keep it in my house constantly. I sometimes use it for medicinal purposes, and with greater frequency I drink it in moderation under social surroundings. I think none the less of my friends who use liquor so long as they do so



with reason. Consumed wisely it is doubtless a harmless stimulant, while at times it is a valued bracer to flagging vital power. In medicine it fills a place with such success that it perhaps has no adequate substitute.

But whatever you or I may think about liquor drinking is entirely beside the question. This I desire to make clear. I desire it understood that my own personal views in this connection are of no importance or significance whatever. Whether I believe in the temperance movement or not has absolutely no bearing upon the problem. The point is simply this: We are facing a great world-movement. It has been instituted by society for the protection and maintenance of its own interests. It will continue its onward development whether we like it or not, and as pharmacists we are affected in so vital a manner that our future reputation and welfare are largely at stake. Prompt and vigorous measures are necessary if we are to avoid public calamity and disgrace.

#### THE DANGER TO PHARMACY.

Why? For the very simple and apparent reason that a small minority of druggists are willing, nay eager, to take advantage of the downfall of the saloon and seize upon the business which it is no longer able to continue. In some of the prohibition States, and in most of the "dry" towns and counties, it is recognized that liquor is a medicinal necessity, and the druggist is consequently given the legal right to dispense it for legitimate purposes. Sometimes a physician's prescription is demanded; in other instances it is provided that the sale must be only for "medicinal, chemical and sacramental purposes," and strict registration of every sale is required; in still other sections different methods are prescribed, but the fundamental expectation everywhere is that pharmacist shall observe the spirit of the law and refrain from selling liquor as a beverage.

Now it is unquestionably wise and proper that by some method or other people who need liquor for legitimate purposes should be left with the means of procuring it, and the drug store is the natural and practically the only place to look to in such an emergency. No article in the *Materia Medica* is more useful and necessary than liquor, and it would be unfortunate indeed if pharmacists were everywhere denied the legal right of dispensing it. It would be nothing short of professional disgrace of the most humiliating character if this privilege were to be taken from us through inability on our part to respect it in letter and spirit, and yet this very thing has been done in some States and sections and is threatened in others.

In such a crisis as we are facing pharmacy suffers from two classes of individuals: First, from those druggists—and, thank Heaven! they are few in number—who are too avaricious and too grasping to wave temptation aside, and who with absolute disregard of their own honor and that of their profession seize upon the opportunity to sell as much liquor as possible;

and secondly and more especially, from those men outside the calling who, unable to conduct saloons, open nominal drug stores, place a registered pharmacist in charge of the front room and in the rear room run what is practically a saloon in disguise.

"Dry" sections are filled with establishments of the latter kind. Unfortunately the general public does not discriminate between legitimate and illegitimate pharmacies, and the whole calling is accordingly made the object of sneers and slanders of the most humiliating character. The manufacturers of comic post cards have seized upon the situation, and throughout the "dry" sections in the South, and perhaps in other sections as well, cards have been widely sold during the last year or two bearing the following verse: "Good-bye, little bar-room, don't you cry; you'll be a drug store by and by."

Not long since I picked up an evening edition of *The Detroit News*, a paper having a large circulation, and found in the most conspicuous position on the front page a sensational article with these head-lines: "City Stunned by Druggists' Fix. Three of the Town's Best Citizens in Jail for Selling Liquor. All High Lights in Business and Society and 'Royal Good Fellows.' Judge and Prosecutor bring Long Established Illicit Traffic to a Halt!" And then followed over two columns of illustrated text reporting upon the matter at length, waxing facetious over the plight of the druggists, and conveying the plain intimation that all pharmacists were but saloon-keepers in disguise. The 40,000 subscribers of the *News* in Michigan and nearby States certainly had no very high conception of the dignity and honor of pharmacy when they finished reading that article, especially since they had read similar things before and were prepared to accept the newspaper's statements and insinuations as well founded in fact.

In my editorial capacity I get newspaper clippings and private reports from all over the country, and I have been appalled at the extent to which the name of pharmacy is being dragged in the dust. All over the United States druggists and pseudo-druggists are being prosecuted and in some instances jailed for the illegitimate sale of liquor. Wherever these things happen they are given the widest sort of local publicity, and editorials are written moralizing upon the situation. Here are 15 druggists in one county of my own State, Michigan, subjected to imprisonment. Out in Missouri one druggist is fined \$1,800 on 18 accounts. A New Hampshire pharmacist is fined \$100 and sentenced to 60 days in jail. Several Nebraska druggists are fined \$300 each. Four Georgia druggists are similarly treated. Out in Kansas, where the prohibition law has been enforced with considerable rigidity for the last two years, the Secretary of the State Board of Health reports after a recent investigation that a considerable number of drug stores are nothing but saloons in disguise, and he has declared his intention of getting after them with a sharp stick. And so it goes. Evidence might be piled on evidence. But what's the

use? The situation is clear and it demands prompt and systematic measures if we are to save ourselves from general and widespread disgrace.

To those who have studied the temperance movement, who realize that it represents no temporary spasm of public virtue, who understand that it is a great world-force which will continue to exert itself with ever-increasing power even though it suffers occasional setbacks, it is apparent that society will not tolerate the practical nullification of its purposes by those pharmacists or pseudo-pharmacists who abuse their privileges and sell liquor as a beverage shamefully and without moral restraint. With increasing rigidity society will punish offending druggists for their shortcomings, or deny them the sale of liquor altogether if no more rational method proves effective, and subject them and other druggists as well to the sin and shame of the public pillory. This is inevitable. Shall we leave the question in the hands of society to settle, and thus all of us stand condemned alike, or shall we as a calling undertake the reform and the punishment of our own criminals and thus prove our rectitude and honor as a profession?

#### REMEDIES.

The answer to this question need scarcely be given. What, then, shall be done? How shall we save the reputation of pharmacy and preserve the pharmacist's right to dispense liquors for legitimate purposes?

In the first place the problem is an individual problem. Every pharmacist in the land ought to see his duty, and ought to discharge it faithfully. Every one should realize that he rests under the most solemn and serious obligation to himself and his profession. He should take counsel of his heart and judgment and follow loyally the path of honor clearly laid out for him.

But there are a few, a very few, to whom such an appeal will prove barren of results, and there are others who, not pharmacists at all, but simply conducting nominal drug stores in order to do a general liquor business can scarcely be expected to have any regard for the welfare of the calling. How to reach them is no easy matter. I present no plan with the positive conviction that it will solve the problem.

It is certainly a time, however, when the pharmacists in every "dry" community should hasten to put themselves on the side of law and order. They should ally themselves with the local authorities, make it clear that they desire to respect the law in both letter and spirit, and assist in exposing and punishing those within their own ranks who threaten to bring them all into dishonor. Only by taking the bull by the horns can he be controlled. No considerations of sentiment or indifference should prevent pharmacists from seeing their plain duty and discharging it.

## WHAT THE ASSOCIATION CAN DO.

This great association, the N. A. R. D., and the hundreds of state and local pharmaceutical societies throughout the country can do much. Every county or city association in "dry" territory might well make the matter a local issue, take control of the situation, outline a policy, eject members who violate the law, co-operate with the legal authorities, and convince the public, the newspapers, and the officers of the law that pharmacy is a dignified and honorable occupation which will tolerate no liquor abuses. This, as I see it, would prove the most effective method of remedying the evil and averting the crisis.

The State associations, too, can do much to develop sentiment among pharmacists and to decide upon ways and means of handling a situation which will prove more and more troublesome as the years roll on. I am glad to see that several of the State bodies, awake to the danger, have earnestly discussed the question at their annual meeting this year and in a few instances have acted definitely either in the passage of resolutions or in deciding to attempt the enactment of a rigid liquor law. The State associations should give the subject their best thought and most earnest effort during the next few years.

## THE N. A. R. D. AND THE A. PH. A.

The Executive Committee of the N. A. R. D., holding its mid-year session in Chicago last winter, debated the topic at some length and finally passed the following resolutions :

Resolved, That it is the sense of the executive committee that the National Association of Retail Druggists is opposed to the illegitimate sale of intoxicating liquors, the committee believing the vending of liquors by druggists should be restricted to medicinal necessities.

Resolved, that the secretary be instructed to give this action of the committee the widest publicity.

This resolution is rather tame in character and is not likely to have any marked effect. It is earnestly to be hoped that the N. A. R. D., at the coming meeting in Atlantic City, will have a fuller realization of the danger, will sound the call of duty in no uncertain manner, and will ask the affiliated associations throughout the country to take a firm grasp of the situation. The N. A. R. D. has the machinery and the organization for carrying out its purposes, and it might well make the liquor question one of its leading issues during the next few years. Nothing that it could do would mean more for the permanent welfare of pharmacy.

The American Pharmaceutical Association, always a leader in pharmaceutical thought, always with far-sighted eye initiating moral legislative, and educational reforms, ought to take action in this as in other things. I shall ask the privilege at the present session of introducing resolutions

which, perhaps with amendments looking toward their perfection, will, I trust, be passed by unanimous vote. But something more than resolutions is required. To "resolute" and then rest with a sense of duty performed is about as futile as Mrs. Partington's attempt to push back the ocean with a mop.

#### LEGISLATIVE MEASURES.

As for legislative measures I must confess that I can suggest no type of bill with the belief that it will infallibly remedy the situation. The subject is involved. It is complex. Doubtless some experimentation will be necessary. The Massachusetts plan, adopted also in one or two other States, and utilized in several States with respect to the narcotic evil, has many advocates. As is doubtless well-known, it involves giving the board of pharmacy power to suspend or revoke the registration certificate of any pharmacist convicted in court of violating the law. In Massachusetts the Board is practically invested with the power of granting liquor licenses to pharmacists in the first place and denying them to those who have been found unfit to have them. In some States the plan is followed of restricting the sale of liquor by pharmacists to "medicinal, chemical, and sacramental purposes," and providing that every sale shall be registered and the registration books kept open to inspection by officers of the law. In other sections the sale is restricted to physicians' prescriptions.

Still other methods have been adopted here and there. I do not now propose to discuss them. I have already written too much, I fear. Each type of bill has its advantages and its disadvantages, and we shall have to feel our way in inaugurating legislative reforms of the liquor question in pharmacy, realizing that only by experiment and trial can we hope to hit upon the best means of controlling the evil. What I most want to do at this time is to breed the conviction that we shall need to give the subject our best thought and that we must ourselves take the initiative in handling the situation by legislative as by other means. Only thus can we head off legislative attacks from outside interests. Only thus can we convince the legislatures and the public that we have no wish to be general liquor sellers, that we desire only to dispense the substance for legitimate and medicinal purposes, that we are anxious to punish those within the ranks who bring discredit upon us all, and that we are members of an occupation who respect our calling and desire above all things to preserve its honor and dignity.

If the worst comes to the worst, it may be necessary in some "dry" sections to eliminate the sale of liquor entirely in drug stores. This very step was earnestly counseled by several members of the Connecticut and Iowa Pharmaceutical Associations at this year's meetings a few months ago. The chain of temperance reform may possibly prove too weak if a single link is defective. Such a discovery would mean a humiliating defeat for pharma-

cists, but if it is made, and if liquor and the drug store must be absolutely and definitely divorced, then I say with conviction that pharmacists should again take the initiative themselves, counsel such a law, stand sponsor for it, and get public credit for defending their professional integrity.

#### CONCLUSION.

The whole sum and substance of my plea is that pharmacists should realize the danger that confronts them, understand that it points to the necessity of prompt and vigorous measures, that it is clearly their duty to take absolute control of the situation as it affects their own calling, and that only by such methods can they avoid public disgrace and dishonor besmirching the entire profession and dragging its standards in the dust.

Great and continued applause greeted the paper just read by Mr. Mason.

The Chair stated that the Section would now hear from a gentleman from the Sunflower State, Mr. Lucius E. Sayre, on the paper of Mr. Mason.

Mr. Sayre said he did not know that he could say anything that would in any way strengthen the paper just read; his only fear was that he might say something that would weaken it—if that were possible. He said he wanted to call attention to the strong words which the writer of the paper had used, and he wished to endorse them heartily. He was convinced from an observation of several years' duration that a great danger was stealing unawares upon the pharmacists of the country, and that unless they made earnest efforts to meet it squarely and honestly, they would wake up some day from their dream of indifference to find their reputation hanging in the balance.

He was from a state where they had been battling with this question of intemperance, and he has frequently said that it was most unfortunate that the handling of the liquor business should have been saddled, by law, upon the druggists.

He described the establishment of one of these "double-header men," as he called them—men who are in the drug business ostensibly, but who, in many cases, do not know a thing about drugs, and who, in reality, do a retail liquor business. He had found in one of these establishments a large refrigerator filled with bottled beer, and a long table, and a cork-puller, and on the shelves and in the drawers a larger stock of liquor than of drugs; in fact, there was everything in the appearance of things to indicate a bar-room, rather than a drug store. In some places he had found so called drug stores that contained not over \$150.00 worth of drugs, and the man in charge of one of these places had confessed to him that he was not a druggist, but had been a real-estate man, and that when he had a prescription brought in, he sent it to a neighboring pharmacist. His clerk had been sick in the hospital for three months, and this man had been running the business. He did not even keep in stock Epsom Salt, and the simplest things that are found in any drug store.

Intemperance has been driven from one stronghold to another, and the warfare is now against the saloons ; but, as a gentleman had recently said to him, the drug store is the last citadel, and the temperance wave will soon be breaking against it.

Mr. Sayre read from the Kansas law to show its rigorous provisions, but sententiously remarked that "it is impossible to legislate the Devil out of existence." The trouble to-day is, not that we need more law, but more force behind the laws we have, and this comes only with public sentiment in favor of the law's enforcement. Public sentiment is being aroused now on the liquor question in a way it has never been before. To show the great public prejudice against druggists caused by the abuse of the name by unscrupulous parties, he related the incident of an honest, upright pharmacist in Kansas City, who, a short time ago, wanted to start a drug store on a corner in one of the best parts of the city, and the whole community was up in arms about it, saying they wanted, no bar-room in their section of the city.

He closed with an earnest plea that this Section of the American Pharmaceutical Association should place itself on record in no uncertain terms against the illegitimate sale of liquor, and do everything possible to strengthen the laws already in existence.

Mr. Payne discussed the liquor question in its application to the State of Georgia at length. He began by telling how the couplet with the sting to it, quoted by Mr. Mason in his paper—

"Hush, little bar-room, don't you cry,  
You'll be a drug store bye and bye,"

had its origin in a change from bar-room to lunch-room in Hoke Smith's Piedmont Hotel, Atlanta's swell hostelry, just previous to the date that the prohibition law went into effect there.

The way that local option worked in Georgia was this : A hundred and odd counties were "dry" and five or six "wet," and the wet counties did the business for the State, the dry counties streaming over into them for their liquor. This caused great dissatisfaction with the prohibition counties, and they finally got together last year and passed the present prohibition law, which is a very severe one. Mr. Payne said he had warned the druggists of the State two or three years ago what was coming, and advised them to procure legislation authorizing the sale of alcoholic liquors in the proper way ; but they failed to secure it, and paid no heed. Then came the prohibition law, that did not allow the use of any liquor containing alcohol—either brandy, whisky or wine ; though the druggist *was* allowed to put up prescriptions containing alcohol, pure and simple, in limited quantities. This placed the pharmacists of the State in a terrible quandary for a time, as the lower court held that this restriction applied even to Pharmacopœial and National Formulary preparations. But they were

finally relieved by a decision of the Court of Appeals. In the last race for Governor, the temperance sentiment was very strong, but both candidates for that office pledged themselves unreservedly to approve all temperance legislation and to veto anything that was not. The pharmacists of Atlanta desired to free themselves from the stigma that rested on them in regard to the use of alcohol, and met and passed resolutions endorsing the prohibition laws and saying that they had no desire whatever to use alcoholic liquors.

Mr. Payne told of the exciting times the pharmacists of Mississippi had had in defeating before the Senate a very obnoxious bill which had passed the House unanimously, prohibiting the use of alcohol in any form, and of his assistance given them in that behalf, by way of a communication showing how necessary ethyl alcohol was as a solvent in the drug business and how innocent was its legitimate use for such purposes. He was of opinion that this matter of the control of liquor and its being handled properly in the drug store is one of tremendous importance, and he said he would be very much disappointed if this Association did not take it up and decide what they would like to see done about it.

After relating a story of a Kansas acquaintance, to show the baleful effects of the "double-header" system of drug store and bar room combined, Mr. Payne came back to the situation in Georgia, and told of a makeshift by the way of "near-beer" and such substitutes for the real thing that the prohibition laws had led to in that State—some of them, he said, containing as much or more alcohol in their ultimate development than the genuine article. Even real wine cannot be used in Georgia for sacramental purposes, and a product called "near-wine" is used instead. He thought the sentiment had moderated somewhat, and the feeling is now that they have been too severe. He gave a warning to those States that have not yet adopted prohibition laws against too much severity in their laws.

Mr. Remington said he had recently come from North Carolina, where they had just passed a prohibition law, and the druggists there were fully alive to the danger which confronted them. He said he did not think the American Pharmaceutical Association could show its attitude on this subject in a more effective way than by the appointment of a committee on this subject, and he moved the appointment of a committee of five, to report to the Association each year on the condition of the liquor traffic and all laws on the subject that may affect the retail druggist and which may be calculated to make him a rum-seller.

This motion was seconded by Messrs. Sayre and Mayo and carried. This committee was not appointed until later.

Mr. Sayre said that the Kansas Pharmaceutical Association had put itself unmistakably on record as strenuously opposed to the saloon drug store, and the feeling was equally well established that the State Board of Pharmacy, if it had the proper financial strength, would be able to deal with the situation as it now exists in the State of Kansas.



Mr. Remington did not agree with this idea of having the State Board of Pharmacy to deal with the liquor question. He believed the Board of Pharmacy should concern itself strictly with the fitness of applicants to practice pharmacy. In every case where their duties have been added to, it had proven a failure, in his opinion.

Mr. Sayre responded that this duty was imposed upon the Board of Pharmacy by law in his State, and that where they found a druggist was not doing his duty under the law they were required to prosecute him.

Mr. Mayo said that Mr. Payne's allusion to the fondness of the Georgia darkey for alcoholic stimulants reminded him of the story of the old Virginia darkey, who, when a gentleman he had served proposed to give him a birthday present, and asked him which he would rather have, a ton of coal or a jug of whiskey, replied, "Marse George, you knows I burns wood!"

Continuing, Mr. Mayo said he pointed with pardonable pride to the fact that the New York branch of the American Pharmaceutical Association had, as long ago as last fall, passed resolutions condemning the sale of liquor of any kind in drug stores. He told of the working of a Massachusetts law passed many years ago, for which Mr. Sheppard was responsible, which, though ideal in principle, had resulted in fierce criticism of the Board of Pharmacy, vested with the power of issuing liquor licenses and revoking same for cause, on account of the introduction of politics into the administration of the law—and to such an extent that Mr. Sheppard, himself, had said two or three years ago that he was convinced the law was not a wise one.

Mr. Mason, referring to the statements made by Mr. Sayre and Mr. Mayo as to the action of the Kansas and New York branch associations, respectively, on the liquor question, said he had a set of resolutions that he wanted to offer for adoption here, showing the sense of the American Pharmaceutical Association on this absorbing and vital question. But before presenting these resolutions he wanted to say that he thought the druggists in every city and county ought to make it a legal issue, and co-operate with the local authorities in the cities and counties, and assist in exposing the druggists who engage in this liquor business unlawfully. "Do not wait for the Board of Pharmacy," he said, "crippled as it is with insufficiency of funds, and crippled also for more obvious reasons." Mr. Mason then read his proposed resolutions as follows:

WHEREAS, A great tidal wave of temperance legislation and reform is sweeping over our own and several foreign lands, and nearly half the entire population of the United States, occupying two-thirds of the geographical area of the country, has already outlawed the saloon in no uncertain manner; and

Whereas, A small minority of druggists are taking illegal and dishonorable advantage of the situation to do a general business in the sale of liquor, while non-druggists, seizing upon the opportunity, are employing registered men, opening nominal drug stores, and really conducting saloons under the protecting cloak of pharmacy; and

*Whereas*, This condition of things presents pharmacy with a grave and threatening danger, is already bringing odium and calumny upon the whole profession, and calls for prompt and vigorous measures if we are to save the honor and integrity of the calling; therefore, be it

*Resolved*, By the members of the American Pharmaceutical Association, that we discountenance the sale of liquor in drug stores for other than legitimate medicinal purposes; that any pharmacist or pseudo-pharmacist who strives to take advantage of temperance legislation for personal profit is a disgrace to the profession and should be ostracised by it; and that as members of an upright and conscientious calling we should ourselves undertake the discovery and punishment of those within our ranks who bring us all into dishonor. Be it further

*Resolved*, That we call upon the city, county and state pharmaceutical associations throughout the "dry" sections of the country to co-operate with the local authorities, prove the intention of the drug trade to respect the law, show its determination to tolerate no liquor evils, and assist in exposing and penalizing those druggists who abuse their privileges and who thus drag the name of pharmacy into the mire of infamy and degradation.

The resolutions offered by Mr. Mason were greeted with applause.

Mr. Eliel, of Indiana, seconded the resolutions as read.

Mr. Asher, of New Orleans, moved to amend, to the effect that a copy of these resolutions be sent with the delegation of this Association to the forthcoming meeting of the National Association of Retail Druggists at Atlantic City, that the National Association might embody the same principle in their work this year. The Chair suggested that this be made a separate motion, and Mr. Asher agreed.

The resolutions offered by Mr. Mason were then adopted by a unanimous vote.

Mr. Asher then renewed his motion. Mr. Kraemer thought it would be better to forward in advance to the President and Executive Committee of the N. A. R. D., a copy of Mr. Mason's address and the resolutions just adopted, so that prompt and vigorous action might be had when the convention met. This brought out the statement from Mr. Mason that this had already been done, on the suggestion of Chairman England, of this Section, when the paper was submitted to him, the idea being that inasmuch as the action of the N. A. R. D. was touched on in the paper, it might be desirable to have them advised of what would be offered here, and accordingly a copy of both paper and resolutions has been forwarded to the President of the National Association.

The Chair said he thought it would be well for the N. A. R. D. to have official notice of the action of the Section taken here to-day, and he thought the resolutions had better be sent anyhow. There were calls of question, and this suggestion was put to a vote and adopted unanimously.

Mr. Mason called attention to the fact that it would be necessary to refer his resolutions just adopted to the Association in general session on Saturday morning for ratification, so as to make them an expression of the Association's attitude on the liquor question, and he so moved. This motion was seconded by Mr. Whelpley and others, and carried.

The Chair then called for a paper, entitled "The United States Food and Drugs Act as an Educator," by Mr. Lyman F. Kebler, of Washington City.

Mr. Kebler presented his subject as follows :

#### THE FOOD AND DRUGS ACT AS AN EDUCATOR.

BY L. F. KEBLER,

*Chief of Division of Drugs, Department of Agriculture.*

Notwithstanding the fact that there is at present a passion for popular education and an overflowing of schools, colleges and universities by eager youth desirous of training themselves in the most efficient manner possible for business and the various professions, and even though there is in our time a great quickening of the conscience for honesty and upright dealing in business, labor circles, politics, legislative halls, etc., the writer is of the opinion that there is no other single factor within the memory of man which has stimulated so much thought, research, investigation and consideration in so short a space of time as the food and drugs act of June 30, 1906. This is not to be wondered at, because it embodies several fundamental principles dear to the American people, namely, honesty, integrity, square dealing and pure and safe foods and drugs which are all of vital importance to the life and welfare of any nation. It is not only a law of the people for the welfare of the people but also a law for the manufacturer or producer or dealer or importer who has found it difficult by adhering to honorable business methods to compete with debased goods and unscrupulous dealers. Its educational as well as its beneficial influence extends from the mother at the cradle to our legislative halls and the highest institutions of learning in the land. State legislators have studied the principles embodied in this act with approval as is shown by the fact that within two years after its passage about two-thirds of the States have passed the same or similar laws, that a similar but more comprehensive law has just become effective in Canada and that Australia is soon to have an analogous act.

It is impossible to do more than briefly touch on a few of the more prominent educational features in this paper. Some tangible results made their appearance even before the act became effective. The law's influence was noted in the home where the father realized for the first time that the meat he purchased on the market as potted ham was not potted ham but ordinary meat ham flavored; and many a mother learned to her sorrow in many cases that she was either directly or through lack of vigilance permitting the dosing of her children with remedies containing morphine, opium, cocaine, chloral hydrate and other agents which are deleterious to the delicate organism of her offspring. Physicians were shocked and nurses were horrified when their attention was directed to the fact that many of the remedies which they were using in the past and which were

considered by them as having very useful properties in the treatment of human ailments were impregnated with the same insidious agents. The druggist also in many cases had a sad awakening when he realized that some of the medicines which he recommended so warmly to mothers for treating the ailments of their children contained considerable quantities of these habit-forming drugs. The temperance advocate was also surprised to find that a recent purchase of his cherished medicine contained a high percentage of alcohol.

Before this information percolated to the public, however, much studying of the law was necessary. The regulations permitted the use of labels on hand at the time the regulations were promulgated for nine months after their promulgation, but the amounts of the prescribed drugs present in remedial agents were required to be declared on the package in some form on all products affected January 1, 1907. This resulted in a study of the standards, formulæ, methods of analysis and processes of manufacture at an early date. It was found, for example, that the alcoholic strength of the menstruum employed in manufacturing certain liquid preparations bore no relation to the amount of alcohol in the finished product. The details of manufacture were carefully examined, and where there appeared to be any loss by evaporation, etc., on account of improper vessels, containers, percolators, etc., suitable provisions were made to eliminate these features and thus insure uniformity. Alcoholic tables were drawn up based on a few experiments, but in practice they were of little service. The methods of determining not only alcohol, but the potent principle of many drug products, were critically examined, and these findings, together with the standards of strength and purity of the pharmacopœial drugs, formed the basis of many appeals to the Committee of Revision for relief, with what results is well known to this audience. The discrepancies in the National Formulary were also reviewed and in many cases adjusted.

Simultaneous with the above work a revision of the labels used in connection with food and drug products was undertaken. The changing of the labels to conform with the requirements of the law required not only the attention of business men, but also the efforts of the chemist, the lawyer and the printer; the chemist because he was conversant with the composition and nature of the products; the lawyer's part consisted in advising his client as to the proper arrangement of the principal label so as to conform with the regulations, and in some cases the arrangements were so adroitly made that they would conform with the letter if not with the spirit of the law, and the result is that all forms of expression occur upon trade packages containing drugs which are required to be declared.

The printers were frequently appealed to by the manufacturer, wholesaler and retailer for information because it was thought that persons engaged in this occupation would make it a rule to be well-versed so as

to supply the necessary information to the trade. In many cases printers keep on hand stock forms which are supplied to all comers, the only change being the printing into the proper space the name and place of the manufacturer or dealer. Be it said to the credit of many printers that the law and the regulations were studiously examined and many visits made by them to Washington for the purpose of adjusting their business. In many cases it was necessary not only to modify the plate but in some instances it required the destruction of the stone or plate employed for printing form and other labels.

Writers of advertisements and advertising agents drew largely upon their imagination in formulating advertising literature and methods of bringing same to the attention of the public. In the past these interests called into play fancy and imagination in exploiting and puffing certain products in which they were interested either directly or indirectly. On scrutinizing this advertising material it was found that many of the statements contained in same were false and misleading in many particulars. It was admitted by all interested that many of the remedies were sadly misbranded but the reasons for existing conditions were explained away by saying that they had no knowledge whatever relative to the composition and virtues of the medicines, their sole purpose being to set the products before the public in their best possible light, little considering the ill effects resulting from such representations. This line of business has been studiously investigated and in most cases the fraudulent statements appearing upon the labels and literature accompanying the package have been eliminated. In some instances these mis-statements have been transferred to the columns of newspapers for the reason that the food and drugs act has no jurisdiction over statements made in same concerning either foods or drugs. The conditions obtaining before the above law became effective were that the unprincipled dealer would make most exaggerated and unwarranted representations relative to his products and in order that the honest merchant could compete in business it was necessary for him to resort to certain expedients which were contrary to his principles and better judgment. The honorable dealer has studied the law very carefully and has expunged and stands ready to expunge any statement or reference in his literature relative to his products which could be in any possible way considered misleading or colored in any particular. On the other hand the interests engaged in goods of a questionable character have likewise studied the law and in addition employed the services of shrewd lawyers for the purpose of enabling them by some device or evasion to handle inferior, adulterated and misbranded products so as to elude the law. For example, the name of the actual dealer importing goods of a questionable character is not known but his goods are consigned either to a broker, a transportation company or some other scheme is resorted to for the purpose of eliminating his name from the transaction.

These men have not only in their regular employment qualified persons, but engage in addition the services of expert chemists and doctors who stand ready to aid and abet them in their nefarious business. Some of these experts stand ready to engage on either side, depending entirely upon the relative amount of the retainer or fee. One chemist when informed that surprise was expressed to the effect that he should lend his influence to the furthering of fraud and adulteration responded that if the other side had retained him he would not have testified in the manner he did. Men of this character will in time be known not only to those engaged in enforcing the federal and state laws but also to the judges as well, and the latter undoubtedly will be guided in summing up the evidence by the character of the men testifying.

This brings me to another important educational feature, and that is qualified chemists, inspectors, botanists, etc. During the past two years there has been a marked dearth in chemists properly qualified, and when it is remembered that out of about 1400 inspectors who took the examination only 14 received a marking of 70 per cent. and above, it can readily be seen that the number of properly qualified men is very meagre. The law certainly has stimulated improvement in this line. While there is not such a large demand for botanists, at the same time we are sorely in need of men well qualified in pharmacognosy and plant structure in general.

Various institutions of learning have seen an opportunity here, and provisions have been made to supply courses dealing largely with food and drug problems so that men graduating from these institutions will be better equipped for the work under consideration. While much has been done toward improving and extending the usefulness of courses of the above character, yet in some cases the qualifications of the men taking such courses can not be as satisfactory as desired. Efforts have been made to the effect that the Civil Service Commission should recognize these schools as giving proper training and thus entitle their graduates to positions in the Government. The examinations hitherto given for chemists in general have been based upon a B. S. degree or equivalent educational qualifications. The B. S. degrees are such as are given by institutions requiring a four-year high school training for entrance and liberal courses in chemistry, physics, the languages and cognate branches of education which will make the possessor qualified to take up chemical problems with proficiency. A number of graduates from pharmacy schools giving a degree in two years or less have succeeded in passing the examination only when the percentage standard was somewhat lowered. These men as a rule enter the work handicapped not only from a monetary point of view but also from lack of qualification, and as a rule they do not give very satisfactory service or feel contented with their remuneration and the character of the work assigned to them. Promotions for men engaged in this character of work are very slow. Teachers of various institutions frequently make the

representation that many of the men are not in a position financially to take extended courses, and for that reason the requirements should be lowered so as to give them an opportunity. In the opinion of the writer there are few deserving persons so situated in our time to whom the doors will be closed if determined efforts are made to obtain a substantial education. It is my experience that if the standard for a degree is placed high the student will make an effort to meet the requirements, and on the contrary if they are placed low he will exert himself sufficiently to obtain the desired goal. I do not think any student will hold in high reverence the name of any teacher who will advise him to take a course which must ultimately place him in a position which will not prove congenial to him in subsequent years. It is at present recognized that a liberal education is essential in all walks of life, whether business, political, manufacturing, etc. The day when it was considered better to have an inferior education and work up through the various branches of an occupation in which one engaged will soon be a theory of the past.

Before concluding it is desirable to call attention to the educational feature which is percolating into other branches of the Government. In view of several recent court decisions dealing with misbranding and misrepresentation the Patent Office has decided not to issue any trade-mark to an individual, firm or corporation which misrepresents or misleads in any particular. This is an important feature because parties owning trade-marks or copyrighted labels have labored under the impression in the past that if a trade-mark was granted or a label was copyrighted the food and drugs act had no jurisdiction. They seemed to forget that in filing the information for the registering of a trade-mark it has not been necessary to disclose the nature of the product in connection with which the name or the label is to be used. For example, certain statements will be used in connection with a trade-mark or upon a copyrighted label which of themselves appear very innocent but when used in connection with certain products are not in harmony with the facts. Such trade-marks have no standing in court. The courts in the past have acted on the policy of clean hands or no relief.

The Commissioner of International Revenue, by instructions from the Secretary of the Treasury Department, has ordered that all distilled alcoholic products be labeled in accordance with the opinion of the United States Attorney General. Exceptions were taken to this order and the courts were asked to grant injunctions restraining the several gaugers from its execution. In a recent case an injunction was denied on the ground that the Commissioner had full authority to direct such markings and that the markings are in harmony with the facts. The question of custom was brought up but the judge ruled that a fraudulent or deceptive practice could have no standing in court irrespective of the fact that it had been in vogue for many years.

The Chair called on Mr. Hallberg, of Chicago, to lead off in the discussion of this paper.

Mr. Hallberg said he did not think the people of the whole country had ever had their attention called directly to this question in so specific a manner as by the enactment of the law in question by Congress. The Pharmacopœia of the United States needed this recognition, because before that the Pharmacopœia was peculiar, in that it had no direct official recognition, except in so far as it was recognized by some department of the Federal Government, and of course by the various State Pharmacy laws containing adulteration sections. He did not intend at all to belittle the influence and effect that this Act had as an educational measure, but there were some features of the Act which were exceedingly dangerous to Pharmacy, because it is to be assumed that this interstate measure will be used as a pattern for State enactment, upon the idea that this measure—although it has application simply to commerce between the States—is equally good as to commerce moving within State lines. Following that idea, a great many of the States,—like the great State of Arkansas for instance, which, through the activity, especially, of Dr. John B. Bond, of Little Rock, a year and four months ago enacted a law which was practically the same as the Federal Act,—have, or will, enact such laws.

Mr. Hallberg had early recognized that, whilst this latitude might be proper in a Federal Act, it was altogether a different proposition when it came to State legislation. He quoted from the National Act :

SECTION 7. That for the purposes of this act an article shall be deemed to be adulterated :  
In case of drugs :

First. If, when a drug is sold under or by a name recognized in the United States Pharmacopœia or National Formulary, it differs from the standard of strength, quality, or purity, as determined by the test laid down in the United States Pharmacopœia or National Formulary official at the time of investigation. *Provided*, that no drug defined in the United States Pharmacopœia or National Formulary shall be deemed to be adulterated under this provision if the standard of strength, quality or purity be plainly stated upon the bottle, box or other container thereof, although the standard may differ from that determined by the test laid down in the United States Pharmacopœia or National Formulary.

So here we have a Federal Act which recognizes our standard in one Section, and in the same Section says it need not be conformed to, *provided*, etc.

Now, if there is anything in medicine, anything in pharmacy, "U. S. P." stands for uniformity, strength and purity ; and if we cannot get uniformity in medicines through this Act, we certainly have not got the ideal act in this Federal law. The commercial exigencies, which are everything in this glorious country, require this latitude, possibly, as to Interstate Commerce ; but we are ready to adopt a law like that for interstate commerce, which will allow the wholesale drug house in Chicago, after getting a



barrel of Epsom Salt, for example, from St. Louis or Philadelphia, with some hieroglyphics stamped on it, "For technical or mechanical use," to dish that out to the pharmacists of Illinois for medicinal use, when it may be loaded with all kinds of impurities? Or, in other words, bought for technical use, but sold for internal use. This is a very serious thing, and this is why he has opposed the adoption of the Federal Act in substance by the State legislatures. As a State measure, this exception should be eliminated, and when, under a State law, an article is sold under a name recognized in the United States Pharmacopœia or National Formulary, it should conform to that standard. Another thing is, that a U. S. P. or N. F. article or preparation should not be required to be labeled with the alcoholic content; that is an entirely wrong principle in a State act, and should be carefully avoided.

It is for these and similar reasons that they have not had enacted in Illinois a pure food and drugs act, because they have felt the necessity of being very careful in this matter, so that they may get only what they want.

Continuing, Mr. Hallberg said he did not know why the government did not establish a precedent in the matter of misbranded preparations. Take "Coca-Cola," for instance; that preparation must contain coca, or it must not be called Coca-Cola. "Syrup of Figs" is another: It should contain syrup of figs, or else it is misbranded. He thought the government should go after some of these "big guns," before it tackles the little fellow, and thereby establish a precedent.

The Chair called on Mr. Eliel, of Indiana, to continue the discussion.

Mr. Eliel said that he only cared to discuss the paper of Mr. Kebler from the standpoint of the pharmacist. He thought the new Pure Food and Drugs Act had certainly been a means of education of the public, and any one engaged in the retail drug business could easily see what a great difference it has made in the character of goods that they are now able to obtain from the jobber. The public is reading about medicine, too, they are reading up in many cases on advanced processes, and the man who is honestly trying to furnish pure drugs is not handicapped now as he was in the past. He gave an illustration, drawn from his own experience, of how the new law was educating the public: A lady had come into his store not long ago and asked for some ground mustard. He waited on her himself, and produced a pure article of mustard, which she objected to on account of its color, saying that she had been accustomed to buy a mustard of a "beautiful golden-yellow color," and this was not pure. He had been accustomed to pride himself upon the purity of his spices, and so he took a mortar and pestle and crushed some of the whole mustard seeds before her eyes, to convince her that it could have no other color than that he had shown her in its powdered state. But she was still skeptical, and would not take the goods. She came back in a few weeks, however, and

asked for some of that mustard. This principle applies to every drug which the pharmacist handles. One effect of the new law has been to cause people who formerly would not pay the price necessary to be asked for a pure article to pay it without complaining now.

Mr. Searby, discussing Mr. Kebler's paper, said that he thought the people of the country were just beginning to value things for what they really were, and that many things they had been in the habit of buying in the past were undoubtedly misbranded in the sense of the law. In his opinion, a great deal of thought has been stimulated by the new law on the part of the public and dealers, as well as on the part of the teachers. He frankly confessed that he, himself, as a teacher, had not paid as much attention to the state of the drug market before as since the passage of the new law. He illustrated how easy it is to have a variance in results by instancing the case of certain hygroscopic drugs exposed to extreme moisture on the one hand, whereby they absorb a great deal of moisture, and to a dry climate on the other, so that, by keeping the same processes and using the same menstruum, two entirely different fluidextracts will be made.

Mr. Searby said that Mr. Kebler had touched upon one of the difficulties that he, as a teacher, had had with his students, viz: The difficulty of having the students see that there is not a thing dropped between the exit from the percolator into the receiver, and to see that nothing is dropped into an open vessel, thereby allowing the evaporation of a considerable portion of the substance. By throwing upon pharmacists the necessity of knowing something of the character of the goods they sell, the Pure Food and Drugs Act compels greater care in such processes, and a number of colleges are now teaching a certain amount of technical work of this kind. All this is the direct result of the passage of the Pure Food and Drugs Act. We have hardly yet begun to understand it and what the ultimate effect will be no one as yet understands. It ramifies through everything—food, medicine, everything.

Mr. Roehrig called attention to the fact that the hour was late, and that no nominations for officers of the Section for the ensuing year had been made as yet, under the By-Law. The Chair stated that before this matter was taken up he wanted to call attention to the fourth recommendation of the Committee on President's Address, and that as this subject was fully covered by Mr. Mason's resolutions adopted, with the permission of the Section it would be understood that there would be no necessity for further action on the recommendation. And the matter was thus passed.

Mr. Kebler, recurring to Mr. Hallberg's remarks on the National Pure Food and Drugs Act, and the quarrel he seemed to have with the proviso in the section as to drugs, suggested that if he knew how it came into existence, he would probably be more interested. Mr. Hallberg responded that he did, and that was his reason for saying what he did.

Mr. Kebler, continuing, said that, nevertheless, there was one feature of the law that enabled the Government to stop these things, so far as importation was concerned, for section 11 read (in part) "that if it appear from an examination of such samples that such article of food or drug offered to be imported into the United States is adulterated or misbranded within the meaning of this Act, or is otherwise dangerous to the health of the people of the United States, or is of a kind forbidden entry into, or forbidden to be sold or restricted in the sale in the country in which it is made or from which it is imported," it shall be refused admission. That clause is similar to the Act of 1848, which prohibited the importation of any drug which was dangerous, or unfit, or improper for use for medicinal purposes, and the Department is working along that basis, trying to keep this class of drugs out of the country.

The Chair called for nominations of officers for the ensuing year, and Mr. Oldberg, seconded by Mr. Searby, nominated Mr. England for Chairman, to succeed himself. No other nominations for Chairman were made at this time. Mr. Oldberg, nominations for Secretary being called for, also nominated Mr. La Wall to succeed himself. Mr. Hallberg nominated Mr. Wilbert, of Philadelphia, but he declined, saying he thought the place should be filled by a college professor.

On motion of Mr. Wilbert, the Section then adjourned to 3 p. m.

#### SECOND SESSION—WEDNESDAY AFTERNOON, SEPTEMBER 9, 1908.

The Section was called to order by Chairman England at 3 : 15 p. m.

On motion of Mr. Ladish, of Chicago, the reading of the minutes of the first session was dispensed with.

The Chair stated that the Section had adjourned this morning without finishing the nomination of officers for the ensuing year, and that there were three members of the Committee yet to be selected, nominations having been made for Chairman and Secretary only. On motion of Mr. Ladish this matter was postponed for the time being, on account of the small number of members present at the opening of the session.

The Chair called for the reading of a paper entitled, "The Committee of One Hundred of the American Health League," by M. I. Wilbert, of Philadelphia. Mr. Wilbert presented his paper as follows :

#### THE COMMITTEE OF ONE HUNDRED AND THE AMERICAN HEALTH LEAGUE.

BY M. I. WILBERT, PHILADELPHIA.

Few subjects now before the American people are more deserving of careful and thoughtful consideration than the widespread movement to prevent the appalling waste of human life and energy by a rational application of certain well-known rules of hygiene and sanitation.

When we learn that in this country alone more than 4,000,000 people are constantly sick, involving an annual expenditure of more than 1,000,000,000 of dollars, and that in a single census period more than 10,000,000 people die from preventable diseases we cannot but marvel that this stupendous waste has been allowed to go on for so long a time unheeded and unchecked.

It should be remembered, of course, that for years and for decades a gallant band of physicians, the vanguard of progress in the science of medicine, ignoring their own pecuniary interests, have agitated consistently and persistently in favor of the prevention rather than the cure of disease.

The present-day awakening to the desirability or the need for a rational application of well-known prophylactic measures is largely due to the widespread publicity that has been given to the lifework of such men as Pasteur, Lister, Koch, Behring and others and the resulting appreciation on the part of the American public of what could be or might be accomplished in the prevention of disease by concerted, intelligent action on the part of civic, state and national governments.

Without the publicity that has been and is being given by the public press to the need for a due appreciation of the facts discovered or evolved by bacteriologists, physiologists, biological chemists, sanitary engineers and the host of scientific workers who are constantly at work delving for new and useful information, it is not likely that there would be appreciable demand for a more efficient safeguarding of the public health.

The lethargy that has been displayed in connection with all matters relating to the public health is unusually well evidenced by the negative character of the contributions that have been made by many persons connected with the several branches of the drug and apothecary business.

Such a collection of incriminating material as that presented by Mr. Samuel Hopkins Adams, in the series of articles on "The Great American Fraud," constitutes an appalling arraignment of all branches of the drug trade as being designed to injure rather than assist the progress of reforms in matters relating to the public health. While it is true that this incrimination is more apparent than real there can be no denying the fact that pharmacists should and must get in touch with the present-day movement and divest themselves of even the suspicion of quackery and quack practices.

The pharmacist or retail druggist who is willing to shape his business in accordance with the general trend of modern thought will find that he will be able to develop a fairly large amount of moderately remunerative business in the drug line, that he will be able to secure for himself a competence, and that, above all, he will be able to develop that unassailable sense of satisfaction that comes from duty well done and the positive knowledge that no one has been harmed or injured.

The Committee of One Hundred, which, more than any other factor, is

directly responsible for the present-day agitation in favor of federal regulation of public health measures, is a committee of the American Association for the Advancement of Science, though the total of its present-day activities resulted from the amalgamation of several independent movements.

The movement resulting directly in the organization of the Committee of One Hundred was the outcome of a paper read by Prof. J. Pease Norton, of Yale, before the Social and Economic Section of the American Association for the Advancement of Science, at the meeting in Ithaca, in June, 1906.

This paper with others of a similar character read at the same meeting, met with widespread approval and resulted, as noted before in the establishment of a committee, which, subsequently was made to be representative of the entire association.

This committee of One Hundred was formally organized in April, 1907, is representative of the leading men and women in several lines of human endeavor and has rightfully been designated as being a list of one hundred of the best known men and women in the country. As an indication of the character of men and women on this committee it will suffice to point out that among educators it comprises such well-known men as President Jas. B. Angell, of Ann Arbor, President A. T. Hadley, of Yale, President Chas. W. Eliot, of Harvard and President Daniel C. Gilman, of Johns Hopkins.

Among the physicians on the committee it will suffice to point out that it includes such men as Dr. Frank Billings, Dr. Jos. D. Bryant, Dr. Geo. H. Simmons and Dr. Wm. H. Welsh.

Among the churchmen we find such names as Rev. Lyman Abbott, Rev. E. E. Hale, Archbishop John Ireland and Rev. Josiah Strong.

Among scientists who are active in this movement we find the names of Luther Burbank, Thos. A. Edison, Prof. R. H. Chittenden and Dr. Jacques Loeb.

These names are representative of the class of men and women who comprise the Committee of One Hundred which is primarily designed to promulgate the idea of a national bureau of health and to promote in every way possible the whole subject of national health.

The campaign as outlined by the Committee of One Hundred, is primarily one of education, it being fully realized that unless there is a widespread appreciation of the need for the public health regulation no efficient measures can be made effective.

To facilitate this proposed campaign a number of auxiliary organizations have been formed ; these include, among others,

The American Health League,

The Press Council,

The Authors' League,

The Press Writers' League,

The Council on Co-operation, and

The Local Advisory Committees of the American Health League.

The American Health League is designed as a popular organization to further the work of the Committee of One Hundred and to assist in spreading a knowledge of its aims and principles. Its object is to interest all persons who are willing to help in protecting the public health by lending financial or moral support to the work of the Committee of One Hundred.

As an illustration of the success that has attended the work of this Committee up to the present time, it will suffice to point out that the national platforms of the leading political parties virtually endorse the efforts that are being made to improve and to enlarge on existing national health agencies with a view of increasing their efficiency and ultimately developing a strong, well-equipped bureau or department devoted to the safeguarding of the public health.

In addition to the endorsement that has been given by the leading political parties, such representative organizations as

The American Medical Association,

The American Academy of Medicine,

The American Surgical Association,

The American Medical Editors' Association, and

The National Dental Association have endorsed the work of the Committee of One Hundred, and have agreed to co-operate with it in its efforts to conserve and to improve the health of the American people.

The immediate aims and the objects of the Committee of One Hundred are so thoroughly in accord with the ideals reflected by the founders of the American Pharmaceutical Association, that it would appear to be all but unnecessary to even suggest that we, as members of that organization, put ourselves on record as being in sympathy with the present-day movement to bring about the safe-guarding of the public health. In view, however, of the frequently expressed suspicions that we as pharmacists are in sympathy with the manufacturers of nostrums and vile concoctions designed to induce pernicious and incurable drug habits, it would, undoubtedly, be right and proper for us to acclaim in no uncertain tone that we are in full sympathy with the present-day movement to prevent disease and to prolong the term of human life. The American Pharmaceutical Association has repeatedly gone on record as being in favor of the establishment of a national department of health, and we as individuals can well afford to reiterate the stand thus taken, and to express ourselves as being in favor of any movement that will tend to foster or to promote the establishment of much-needed federal control of all matters relating to the public health.

The Chair invited discussion on the paper just read, and called on Mr. Kraemer to open the discussion.

Mr. Kraemer began the discussion by saying that Mr. Wilbert had very well shown in this model and interesting paper, the nature and origin of this health movement, and the manifest interest in it now existing. He thought all were perhaps familiar with the dictum of Emerson that "the first wealth is health," and it remained for Theodore Roosevelt to place the matter in the form of a duty—that the preservation of the national vigor should be a matter of patriotism. He did not care to enlarge on the subject, but he would like to quote from a paper read at Yale University, in the annual address on medicine, by Professor Sedgwick, of the Massachusetts Institute of Technology, who took for his subject, "The Call to Public Health." The nature of the address equally befitted a gathering of pharmacists, and he would simply make a few abstracts, and connect them as well as he could :

As long as this present every-day world and this ordinary human life were held, whether by ancients or by medievals to be merely the prelude to another and better, any serious struggle for longevity, any earnest plea for health for health's sake, fell upon deaf ears. As long as a sick man or his friends could honestly exclaim in the face of sickness or death, "I know that if my earthly house of the tabernacle be dissolved I have an house not made with hands, eternal, in the heavens," disease and death lost their terrors, and even became almost attractive. The call to life, and to life in this world, is the first and fundamental call of the scientific age. And the next is the call to health, *i. e.* wholesome full, normal life.

This truth runs through this address, until we come to the portion here where he says :

The call to health has humanitarian aspects. Is it a light or small affair to postpone premature death, or to avoid sickness and thereby postpone or avoid the pain, the sorrow and the weeping of them who would mourn? Is it not a kind of cruelty to allow infected water or milk to carry into happy homes the germs of typhoid or scarlet fever? If a thief in the night should wound and kill, as milk-borne typhoid often does in a family of children, should we not call him cruel? Sickness and deaths from carelessness are not, perhaps, as repugnant or as cruel as those from malice or robbery, but the actual effects upon the family and the social organism are much the same.

He also referred to an address delivered by Dr. McCormack, in Philadelphia, recently, in which he compared the mortality in the Army due to disease on the one hand and bullets on the other, and had pithily remarked that it did not matter whether a man was killed by typhoid or bullets, he was a dead man ! And it was very much the same with the health movement : sanitation, the development of water-supply, etc., were matters of vital importance. He quoted from Dr. McCormack :

Physicians and doctors, naturalists and teachers of physic, *i. e.* of nature—need any one ask for a nobler vocation. But if teachers and students of nature, you must be learners, also, and that not merely of the healing art, but of that other equally important sister art, the art of prevention.

And again :

The relation of the physician to the public is rapidly changing. We will soon be expected to be as proficient in the art of prevention as in that of healing.

Continuing, Mr. Kraemer said that, as for himself, there was one thought he wished to give expression to at this time, and that related to what should be the attitude of pharmacists toward this movement. Unquestionably, in his opinion, pharmacists as well as physicians should heartily sympathize with any movement having for its object the safeguarding of the health of the people. Their aim at all times should be first and primarily to prevent disease ; and second, to aid in the restoration of health. Seriously, he would like to impress the truth that, although pharmacists and physicians seemingly occupy the anomalous position of depending upon the sufferings of humanity for a livelihood, their only function primarily is that of preserving and maintaining the public health.

Mr. Kraemer said that, in closing his remarks, he desired to present the following resolution for the consideration of the Section :

#### RESOLUTION ON A NATIONAL DEPARTMENT OF HEALTH.

WHEREAS, The members of the American Pharmaceutical Association have repeatedly and consistently expressed themselves as being in favor of a National Department of Health; and,

*Whereas*, The Committee of One Hundred of the American Association for the Advancement of Science, the American Health League and the several co-related bodies, are actively engaged in a propaganda for the promotion of interest in matters relating to the public health; now, therefore, be it

*Resolved*, That we as members of the American Pharmaceutical Association request that this Association in general meeting endorse the object and the principles of the Committee of One Hundred and of the American Health League, and offer to co-operate with them, and with other organizations, to promote the development of existing agencies devoted to the safeguarding of the public health, and to advocate the ultimate development of a National Bureau or Department of Health.

Mr. Roehrig made the comment that it seemed that the Committee of One Hundred took in about everybody but pharmacists ; that the pharmaceutical profession had been entirely ignored, in that not a single pharmacist had a place on the committee.

The Chair then put the vote on the resolutions as read by Mr. Kraemer, and they were adopted.

At the request of the Chair, Mr. Kraemer then proceeded to present as follows a paper he had prepared on the subject of the teaching of pharmacognosy :

#### THE TEACHING OF PHARMACOGNOSY.

BY HENRY KRAEMER.

In a previous paper I undertook to discuss what constitutes pharmacognosy or the objects had in view in pursuit of this study. Pharmacognosy is a comparatively new branch of botanical science and is still in a state of



evolution. Its value heretofore has not been well understood, but with the progress that is being made it is coming to be better appreciated. So long as we were indifferent to the quality of the drugs which we handled and so long as we were ignorant of the conditions in the drug market, we had not much use for a scientific or more intimate knowledge of vegetable drugs. Now, fortunately, the necessity for work along this line is being felt by both wholesale druggists and vegetable drug dealers as well as by retail pharmacists. Furthermore, the working of the Food and Drug laws is making it necessary for us to have a definite knowledge of all the substances used in medicine, and it is imperative that we do all that we can to equip the pharmacist to carry on the work of testing and confirming the quality of his drugs himself and to assume the full responsibility for the quality of the drugs and preparations which he sells and dispenses.

It might be well before going further to define or repeat what I consider to be the principal object in the study of pharmacognosy as it relates to the training of the pharmacist. In view of the problems that confront us and that are constantly arising, the aim first should be the attainment of a definite and working knowledge of the macroscopic and microscopic characters of the drugs rather than a general knowledge of them. In other words, the student of pharmacognosy should first of all be taught how to identify vegetable and animal drugs in the crude, comminuted or powdered condition, to determine their quality and to prevent their deterioration.

The main reason for this contention, or discussion along this line, is that the time devoted to the courses in the schools and colleges of pharmacy is too limited to cover thoroughly such a wide range of subjects as are grouped under the head of pharmacognosy, or as properly belong to it. Up to a few years ago the instruction in pharmacognosy consisted for the most part in giving lectures about drugs, the information given being largely historical, and in many cases derived from text-books on *Materia Medica* intended for both pharmaceutical and medical students. The fact that works on *Materia Medica* were written as texts for both pharmaceutical and medical students, shows how hazy our ideas were as to the kind of drug knowledge pharmacists as well as physicians should have. The result has been that the student of pharmacy has gone forth for the most part unqualified to handle the problems associated with mis-labeling, adulteration, and inferiority in quality of drugs, or to determine, for example, whether the inula which he purchases is admixed with belladonna or consists entirely of belladonna, or whether belladonna root is adulterated with phytolacca root or scopola, or to prevent the development of insects in crude and powdered drugs, or to detect olive endocarp in ground gentian. Furthermore, he goes out with the impression that as he is able to give the botanical name of a medicinal plant, or its habitat, or its medicinal properties, he is therefore competent to handle the drug: and yet it is possible for him to learn all this and still be unable to recognize

a specimen of the drug. This is also a common mistake of many examiners, who think that because a student can answer a set of questions, he must of necessity have a knowledge of the subject; whereas, the student cannot be considered to have a real trustworthy knowledge of drugs unless he can demonstrate what he knows concerning them with specimens in hand.

When once the end sought in the teaching of pharmacognosy is understood, or the objects to be attained are agreed upon, the methods to be pursued in attaining this end will be more or less uniform. Without entering into the details of what shall be included in a course in pharmacognosy, I merely wish to call attention to some of the general principles that should guide us in the teaching of this branch.

1. It is necessary that the student acquire not only a good general knowledge of botany, but that he be especially grounded in structural botany, including external morphology and internal morphology, or histology, and also that he be instructed in obtaining a practical or working knowledge of systematic botany; in other words, he must be given that special training and instruction in the study of plants and plant structures which will enable him to become familiar with the principles which underlie the proper and systematic study of both crude and powdered, or ground, vegetable drugs.

2. The training in connection with the use of the microscope, including the application of reagents, is only second in importance to that of the study of the plant material itself, because it is a means to an end. For, if the technique is not well understood, the results are likely to be misinterpreted and in some cases more harm than good done. In this connection I desire to refer to one or two points that should be borne in mind in the microscopic study of the vegetable drugs. I find in many cases it is equally, if not more, important to examine longitudinal sections of the drug, as transverse sections. Longitudinal sections are not only helpful in identifying the crude drugs but absolutely essential in acquiring a knowledge of the elements of ground or powdered drugs. Another important feature connected with the microscopic study of crude, as well as of powdered drugs is the micro-measurement of cells, cell-walls, and cell-contents of definite form.

3. As individual collections of authentic drug specimens are useful to the student for purposes of study not only during his college course, but also for purposes of comparison subsequently, it is highly desirable that each student be encouraged to make such collections. In connection with our course of instruction, we give the students specimens of all of the official drugs and some of the important non-official drugs, and they are expected to put the collection in a permanent form, and are rated upon the care taken with the specimens and their knowledge of them or ability to identify them. Some years ago one of our students suggested the use of type

trays, such as are used by printers, and which are covered with glass, for keeping the specimens, and this method of keeping them has become rather popular, for the reason that the tray with its compartments, is compact, inexpensive and attractive. Specimens of powdered or ground vegetable drugs are most conveniently kept in homeopathic vials, and should be arranged on a cardboard according to the color, as I showed in my paper on Powdered Drugs presented to this Association in 1898. While we do not make it obligatory for students to make permanent collections of powdered drugs, we assist any who may desire to do so. The students are also encouraged to make permanent collections of microscopic slides, and in addition to the sections which he himself is required to make, is furnished with a set of about 100 slides for study during the course.

4. While the student can not be expected to become familiar with all of the plants that yield vegetable drugs, it is highly essential that he acquire a knowledge of as many of the living medicinal plants as possible, as a knowledge of the habits and characters of the plants from which drugs are derived is often helpful in judging of the quality and characters of the drugs themselves, and is also of importance in the collecting of authentic material for purposes of study and comparison. A botanic garden should be connected with every college of pharmacy, and botanic excursions should be conducted in conjunction with the course of instruction.

5. With the advances in preliminary education, the most serious handicap to the development of the courses in pharmacognosy lies in the shortness of the courses in the schools and colleges of pharmacy. The time devoted to laboratory instruction in pharmacognosy is by no means adequate. The number of hours for the entire course should be at least two hundred, and the number should be increased to four hundred hours as soon as practicable.

In order to indicate the nature of the work as we conduct it, I submit a series of questions which have been given to our students during their three-year course.

#### FIRST YEAR FINAL EXAMINATION.

##### *Practical Botany.*

1. (a) Fully describe the parts of the Compound Microscope. (b) Describe the construction of the objective, and state what kinds of objectives are generally used. (c) Of how many lenses is the eye-piece composed.

2. (a) Define the term Micron. (b) How many microns are in a millimeter? (c) How many microns are in an inch? (d) What is meant by a stage-micrometer? (e) What is the customary length of the divisions of the stage-micrometer? (f) For what purpose is a stage-micrometer used? (g) Describe the ocular micrometer. (h) How is the length of the divisions of an ocular micrometer determined? (i) If twenty divisions of an

ocular micrometer correspond to ten divisions of the stage-micrometer, what is the size in microns of each division of the ocular micrometer?

3. (a) Name the principal micro-chemical reagents used in the study of vegetable drugs, and give their effects on each of the following substances: Starch grains, Calcium oxalate crystals, Stone cells, Tracheæ, Wood fibers, Bast fibers, Parenchyma and Cork.

4. (a) Identify the Crude Drug. (b) Give the U. S. P. definition. (c) Write a complete macroscopic description. (d) Make transverse and longitudinal sections and write a microscopic description, illustrating the same with drawings. (Hand in the slide containing the sections which you have examined.)

5. (a) Identify the powder, give the size of the tissues and cell-contents, making drawings of these. (b) State what reagents you employed, and give the results obtained.

6. Identify the microscopic mounts, which will be given you, making drawings of the sections.

#### SECOND YEAR FINAL EXAMINATION.

##### *Pharmacognosy.*

1. Identify the specimens of crude drugs, write a complete description of each, and underscore what you consider to be the important characters.

2. (a) Identify the powders in the small envelopes, taking care to give the number on each envelope in connection with your answer. (b) Give full descriptions of the powders, including color, odor and taste, and illustrate the microscopic characters by means of drawings.

3. (a) Identify the crude drug in the small envelope, make a section of it, describe the histological structure, illustrating the same with a drawing, and hand in the preparation, placing your name and desk number on the slide. (b) What is the official micro-chemical test for this drug, and according to this test, is the specimen of good quality?

4. *Seeds.* (a) In what portion of the following seeds is starch found: Colchicum, Nux Vomica and Strophanthus? (b) What is the official test for starch in ground Mustard and Flaxseed Meal?

5. *Roots and Rhizomes.* (a) Give all of the distinguishing characters of the following drugs: Belladonna Root, Scopola, Inula, Althaea and Phytolacca. (b) State what drug has been largely used as a substitute for Spigelia in recent years, and give its distinguishing characters.

6. *Barks.* (a) Name the microscopical characters which distinguish Rhamnus Purshiana, Rhamnus Californica and Rhamnus Frangula. (a) Name the commercial varieties of Cinnamon, and give their macroscopical, microscopical and chemical differences.

7. *Leaves and Herbs.* Name the commercial varieties of Buchu, Cannabis Indica, Coca, Pilocarpus and Senna, giving their distinguishing characters, and stating which commercial varieties are preferred.

8. *Fruits.* (a) What is the official definition for *Cardamomum*, and in what portion of the fruit is the active principle found? (b) Give the official definition for *Colocynthis*, and state what portion of the fruit is used in making preparations.

THIRD YEAR FINAL EXAMINATION.

*Technical Microscopy.*

1. (a) What adulterants are mostly found at the present time in the following drugs: *Belladonnæ Radix*, *Belladonnæ Folia*, *Gentiana*, *Asa-fœtida*, and *Coccus*? (b) By what means are they detected?

2. (a) Give the pharmacopœial definition for *Vanilla*, and state the A. O. A. C. standard for it. (b) Mention some of the commercial varieties of *Vanilla*. (c) How is the presence of *Tonka* in ground *Vanilla* detected? (d) Mention five plants containing a vanillin-like odor.

3. (a) What important economical products are derived from wheat grain? (b) Mention the various histological elements found in wheat middlings. (c) How is this substance distinguished from the by-products of other cereals? (d) Mention some of the uses of wheat middlings.

4. Name the distinguishing characters of the following substances: *Amylum*, *Dextrin*, *Powdered Acacia* and *Powdered Tragacanth*.

5. (a) Identify the microscopic preparations which will be handed you, and describe the histological characters of each, illustrating the same by means of drawings.

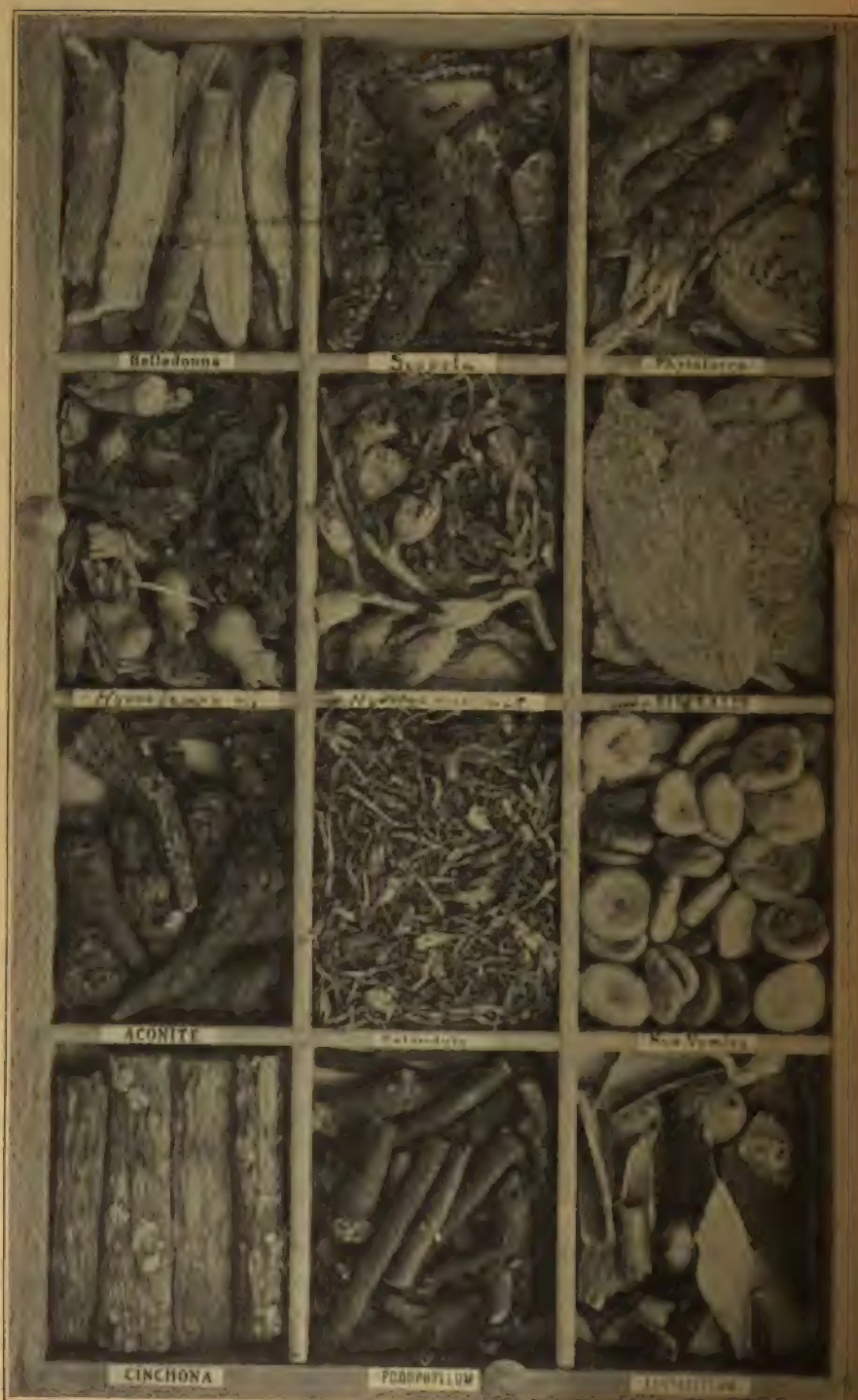
6. (a) Identify the powders in the small envelopes, taking care to give the number on each envelope in connection with your answer. (b) Give a full description of each powder, including color, odor and taste, as well as microscopic characters, and illustrate the latter by means of drawings.

7. Identify the crude drug specimen; write a complete description of it; state what drugs resemble it, and how they are distinguished from it.

During the presentation of his subject, Mr. Kraemer exhibited a shallow, wooden box or tray for holding specimens of crude vegetable drugs collected by students, in size about 8 by 18 inches and containing twelve divisions or compartments, the whole covered with glass (see Fig. 76). The students, he said, were expected to make a collection of such drugs, and this was a device for ready reference in the inspection and identification of drugs. He also showed a convenient, small wooden box arranged to hold some 25 microscopic slides or sections, for the examination of powdered drugs.

The Chair expressed regret at the absence of Mr. Rusby, of New York, who was expected to lead in the discussion of this paper, and invited discussion by other members.

Mr. Asher said he had listened with a great deal of interest to the paper of Mr. Kraemer. He recalled the time when he studied pharmacognosy



as outlined. He said he believed a resolution would be in order at this time, and he would move that this paper be printed and copies of same be sent to every teacher of pharmacognosy in every college of pharmacy in the United States. The paper contained many valuable points—points that pharmacists would not stop to consider in the ordinary reading of the journals, but which, if they were sent to the journals as a special feature, they would pay a great deal of attention to. He believed that Mr. Kraemer had opened the eyes of the members to the insufficiency of the teaching of pharmacognosy in the past.

Mr. Ladish seconded this motion, provided it did not take too much money; he did not know the condition of the treasury.

The Chair suggested that as the paper would be published in all the pharmaceutical journals anyhow, he doubted the necessity of this motion. The paper would undoubtedly be widely published, and receive wide attention. Besides, the Section had no authority to pass such a resolution without ratification by the Association in general session.

Mr. Whelpley, discussing the paper, said he had also enjoyed it, and especially appreciated the author's bringing out so strongly the fact that pharmacognosy teaches the druggist how to know drugs when he sees them. Many a teacher has that yet to learn. About all some of the Boards of Pharmacy examiners know about pharmacognosy is the definition—at least, that is all that is evidenced; and that definition is different from the one given by the author of the paper. In other words, the Boards of Pharmacy have very few questions on pharmacognosy, as explained and demonstrated by Mr. Kraemer. If reprints were to be sent to anybody, he thought they might well be sent, printed in large type and underlined, to the Boards of Pharmacy. This condition was due, it was but just to say, to the fact that the members of these boards, as a rule, had graduated at a time when, as Mr. Asher had said, there was very little opportunity of knowing what was meant by "pharmacognosy."

The collection of drugs by the student, as demonstrated here, was certainly a most excellent idea, and he was particularly impressed with the manner of making these collections in tight cases. This is a little point, but inventions of this kind are exceedingly valuable to the teacher. This idea would undoubtedly be taken up by many of the colleges. It was somewhat exceptional, he said, for a man who devoted so much of his time as Mr. Kraemer did to careful microscopic work to take the trouble to bring before the meeting such as this these small practical points—these things little in themselves, but which in the aggregate go so far towards making a course of instruction practical and valuable.

He was also impressed with the author's reference to first of all identifying drugs by sight. Many a nasty taste would not be left to linger so long in the student's mouth if he had learned that he could identify the drug by looking at it. The natural inclination of a baby is to put every-

thing in its mouth, and students of pharmacy seem to be affected the same way. He had, time and again, advised students who were going before Boards of Pharmacy to first look at the drug, and see whether they could not identify it by means of the eyesight ; secondly, to smell it, and, third, to very carefully taste it, if necessary. There are but few crude drugs that cannot be identified by the sight and by certain manipulation of the drug.

The obliging of students to make individual collections of drugs was certainly a very commendable thing. He was much interested in the roof-garden described by the author. In St. Louis they have a medicinal garden in Shaw's Botanical Garden, containing many hundreds of plants, that are under the special care of a gardener.

He also commended the practical nature of the questions on microscopy, and the stress laid upon microscopic technology. In medical colleges microscopical technology is very meagerly taught. The student as a rule is given a microscope, without any explanation of its construction, and he knows and learns very little about its proper use. In colleges of pharmacy he believed microscopic technology is quite generally taught, compared to what it is in medical colleges.

The examination of drugs—that is pharmacognosy—divides itself into three divisions : First, the recognition of drugs by the eye and the other senses. Second, the recognition of drugs by means of a simple microscope, that is, drugs that have characteristics that are plainly revealed by a simple microscope, but not easily detected by the naked eye. Third, those drugs that acquire a compound microscope for identification. At one time there was only a small list of these, but now that we have powdered drugs so generally used in commerce, such drugs constitute the major portion of pharmacognosy, and hence the reason for the author's exhaustive report on the microscopical part of pharmacognosy.

He had occasion two years ago to recognize the value of microscopical examination of drugs when a problem arose of determining whether a certain addition had been made to a powdered drug, whether it was hyoscyamus, belladonna or stramonium. The chemist was not able to determine which one of these substances it was, when the test tube did not reveal that fact. The compound microscope detected it easily by identifying the hairs that were found in the powdered drug. By means of the hairs the adulteration or admixture was identified, and it was unmistakable. This shows the necessity, as Mr. Kraemer says, of first of all studying the histological structure of plants. Mr. Whelpley congratulated the Association upon having such an able paper presented.

The Chair said the paper would take the usual course.

The Chair then called for a paper upon the subject of Commercial Training in the Teaching of Pharmacy, by Mr. Remington of Philadelphia.

Mr. Remington presented his subject as follows :



## COMMERCIAL TRAINING AS A FACTOR IN THE TEACHING OF PHARMACY.

BY JOSEPH P. REMINGTON, PH. M.

Pharmacy as a vocation has many sides and points of view. It is at once profession, art and trade, and it is to be regretted that all who practice pharmacy cannot unite in the statement that each point of view is equally entitled to respect. We frequently encounter the narrow-minded specialist who, in the enthusiastic pursuit of the particular branch of pharmacy with which he is enamored, sneers at every other branch, and he is sure to place a value upon his own work far above its deserts and upon himself, an estimate and appreciation not accorded by his fellows.

The merchant, who has achieved a financial success, through his own efforts and through the exercise of the proper factors, but who has never had the opportunity or the time to investigate the achievements of science, believes that he should, in season and out of season, proclaim his contempt for scientific men, and if he encounters a scientist, face to face, in a business office, while the latter, filled with enthusiasm, descants upon his favorite hobby, the danger flag is at once run up; yawns, at first covert and afterwards open, are often succeeded by the intermittent closing of the eyes, and if the conversation is continued, unmistakable sounds from the nose and throat proclaim that a state of practical unconsciousness has been reached.

The narrow minded scientist, on the other hand, is likely to show actively his contempt for what we consider a less intellectual pursuit, *i. e.* commerce or business, and he probably leans towards the idea that a man cannot succeed in accumulating wealth in trade without being dishonest, and that great fortunes cannot be accumulated without deception, fraud or graft.

In some ultra-scientific clubs, there are men, who regard business men, who have accumulated a fortune, as happy possessors of lucky attributes or creatures of circumstances, and they regard themselves as superior beings, actuated solely by altruistic motives and hence mercenary motives are, to their minds, wholly disreputable.

It is a curious fact that the manner of cutting and dressing a man's hair should now be regarded as a distinction, whereby the artistic and professional man may be differentiated from the business man. Musicians are probably more given to weakness, in this respect, than any other class of artistic or professional devotees. Paderewski is probably better known among the masses of the people for his fluffy, hirsute adornment, than he is appreciated by them for his exquisite music, and one would suppose that a first requisite for acquiring popular fame as a musician, is to allow the hair to grow and to brush it straight back from the forehead. The artist who essays to portray on canvas the charms of nature, thinks that he can work much better when he does not cut his hair too often.

On the other hand, the business man with long hair would be distrusted in Wall Street, and looked upon with suspicion as a crank, an anarchist, or at least a visionary. These are, of course, surface indications, but they nevertheless possess real value as a means of differentiation. Yet there is a middle class, who are often regarded by the extremists with disfavor; they are considered to be neither good musicians, artists or business men. They occupy the sensible ground of looking beneath the surface and wisely consider that the method of wearing the hair, long, middle or short cut, has nothing whatever to do with the quality or the fiber of the man's brains; probably some of my hearers are wondering what this has to do with Commercial Training in Pharmacy. We will see. The pharmacist should be a professional, artistic, commercial man, and should wear his hair as best suits his convenience, but probably the best style would be neither too long nor too short.

When colleges of pharmacy were founded there were probably reasons for limiting the curriculum to the most necessary branches that should be taught outside of the store, and although they were called colleges of pharmacy, the employer or preceptor, who instructed his apprentice every day, in pharmaceutical work, was regarded as a prominent factor in the student's education. Hence chemistry and materia medica were the only two branches taught in the beginning.

After the need for college education had been established and shown to be necessary, chairs in pharmacy were founded, and this, for a long time, was considered to be a liberal education for a retail druggist. Laboratories came next, and the superiority of this kind of teaching caused a rapid development, but still one of the most important branches of instruction was ignored and is still practically quiescent in many institutions of learning. Commercial training is as important as any other department of instruction when planned so as to give what is necessary for the pharmacist, and excluding the vast amount of training suited to other kinds of business.

The college-bred student, educated on the old lines, gained his knowledge of commercial usages by the "rule of thumb" method of watching his employer. The employer, while frequently willing to instruct his apprentice in the methods of the store, in the importance of neatness, in cleanliness and the dispensing of packages, jealously guarded his business and forms for various personal reasons, one probably being, that of not making it too easy for the apprentice to start a store in his neighborhood. Then, again, the preceptor, having derived his business training from his employer, retains all the faults and virtues of the employer, and passes them along to his apprentice in turn. How many thousands of able men, graduates in excellent standing in our colleges, have gone to their graves, after having eked out a pitiful existence, because they had never been taught the first principles of successful business.

What records they might have made, and how many more comforts they might have given to their families if they only had been, what they were so often taught to despise, good business men. Why should there be a prejudice to-day, by so-called professional men, against the business man?

We Americans are workaday people ; there is probably no country in the world where merit, from whatever cause, is so promptly rewarded. Heredity has no doubt a great influence in determining success, but it should be considered as merely a gift, just as attributes of the mind are regarded, and men should be judged solely by their merit and by what they are able to accomplish. The false and contemptible prejudice against business held by men who follow the professions, is more hurtful to themselves than to any other class. Men of brains who are our leading financiers and capitalists to-day, would undoubtedly have been equally eminent in science if the accident of choice in their earlier years had fallen that way.

But to turn now to the practical and concrete : it is a significant fact that our great universities are now founding chairs which deal with business, and a term which would not have been understood fifty years ago, will soon be a common phrase, " the science of business."

Surely a scientific man who devotes himself, with the enthusiasm and persistence which brings success, should be able to understand the principles and forms of business thoroughly, in order that he may take his place as a man, entitled to every consideration of justice and right to a financial reward, for " the laborer is worthy of his hire."

There have been noble examples of self-sacrificing souls who have pursued science through great discouragements, privation and toil, and who have died in poverty and neglect, yet who have left behind them a fame which has been undying, but these must always be regarded as geniuses and they deserve our highest encomiums, but the ambitious young man, without the mental equipment of the genius, who holds aloft the records of such a one and seeks to follow in his footsteps, should be cautioned to stop, look and listen and to examine himself most carefully to see if he has the other qualities possessed by the genius, or he may find too late in life, that he has accomplished no scientific achievement worthy of record and he is without the necessities of life.

Business ability by no means signifies the accumulation of great wealth. Indeed the many examples reported in our daily papers go far to prove that wealth is a snare and a delusion to the majority. But the ability to maintain oneself in a proper position in life and to be independent to such an extent that scientific work is possible under the best conditions ; that reasonable recreation may be had ; that one may be able to relieve the necessities of others who are less fortunate ; that children should be properly educated and started in life, these are reasonable ambitions to be attained by what is commonly known as amassing a competency and

such a condition cannot be realized if the scientific or professional man sneers at business methods and neglects the plain teachings of self-protection.

An experience of ten years of teaching this branch in a college of pharmacy, beginning with opposition and uphill work, has thoroughly confirmed the writer in the opinion that Commercial Training should have been one of the first branches taught at the beginning of pharmaceutical education in this country, and it is the student that shows the greatest ability in comprehending the mysteries of chemistry, botany and other theoretical branches, who most needs the instruction in Commercial Training.

How often do we see the brilliant scientist, in his latter years, nothing but a hack in a laboratory or office, and how often do we hear the younger men in the firm or corporation, and oftentimes the head of the house, say "oh yes, he was a great student, he worked night and day when he was young, but he was a perfect baby in business and he does not yet know how to take care of himself."

There is just as much reason also for the doctor to be a business man and be able to collect his bills, and the medical universities and colleges should introduce business training as a part of the curriculum. There is probably not the same necessity for educating lawyers, for they are supposed to teach business men the principles and practices of business law, but it is too much of a flight of the imagination to predict that even our schools of theology will, in the future, possess a chair on business enlightenment.

It is true that there must always be men of surpassing business ability, those who seem to have the instinct for accumulation and these are often lead to overreach their neighbors, to adopt secret, dishonest methods of increasing their hoards, and to this class no word would be useful in restraining them from excess. But there is a better day coming and there is hope that men will be restrained in the future from employing dishonest methods for acquiring riches.

The standard of commercial honesty is being raised and the United States Government is engaged in a mighty struggle in ferreting out deceptions, frauds and adulterations. Inasmuch as the pocket-books of merchants are being influenced more and more, it must perforce result in the creation of a higher standard and the time is not far distant when we may look for honest labels on dry-goods, bars of steel, coils of rope and even anchors, for although foods and drugs effect the health of the Nation, honesty in trade, as a principle, will be forced upon the Country, because the education which is now going forward will demand it.

Mr. Remington said, in connection with his paper, that Harvard University had established a chair on the science of business.

The Chair next called for a paper by Mr. H. V. Army, of Cleveland, on Commercial Training as applied to Laboratory Work. Mr. Army presented his paper as follows :

## COMMERCIAL TRAINING AS APPLIED TO LABORATORY WORK.

BY H. V. ARNY.

Since the question of commercial training as a part of school of pharmacy instruction was brought to the attention of this association by Mr. F. G. Ryan (Proc. A. Ph. A., 1900, 99), practically all our schools have seen the value of such a course, the only problem being adaptation of the idea to the needs, requirements and curriculum of the individual school.

A course of this kind carried out by means of lectures only has the same disadvantage of any other didactic system—the average pupil requiring something more than the abstract to make a lasting impression. On the other hand a complete commercial course, including book-keeping, takes a large amount of time and moreover can be obtained as satisfactorily at a regular commercial college. Is there any way that the idea can be applied to the work done in the regular pharmaceutical course, and that without taking too much time from a curriculum of abundant work and limited hours?

For the past three years the writer has applied the Commercial Training idea to the manufacturing work done by his students; giving them an insight into commercial procedure and at the same time affording himself an absolutely fair method of gauging the value of such laboratory work done by each individual.

Each student is furnished at the outset of the course in the manufacture of official inorganic preparations, a complete set of all the chemicals required for this work. The student has to write an order for the goods (*Exhibit A*) (giving opportunity to discuss various methods of ordering and various means of transportation) prepare a bill for the goods from market quotations (*Exhibit B*) (affording a chance to study the art of buying) check up the set when received and furnish a note covering amount of invoice (*Exhibit C*) (bringing up the subject of various modes of banking—cash discounts, bank checks, discounting notes, etc.).

The set of chemicals is held by the student through the entire year and used as required.

Each preparation made is handed in and acknowledged by a dray receipt (*Exhibit D*) the sample being then turned over to the student of the upper class for pharmacopœial assay and for measurement of yield.

This gives practical work to the class in volumetric analysis and at the same time shows up the superficial youth who furnishes an elegant appearing product of large yield but of poor strength. The results of analysis are given on a report blank (*Exhibit E*). From the report of the analyst as to strength, quantity, impurities and appearance, the instructor deduces the real value of the product, say that it is 50 per cent., 75 per cent. or 100 per cent. of the market value of the theoretical amount of the ideal product. Thus if 250 Gms. of 5 per cent. solution of sodium

hydroxide is the expected product or 100 per cent., then 300 Gms. of a 4 per cent. solution is 96 per cent. of the ideal and 200 Gms. of a 3 per cent. solution is but 48 per cent. of what it should be and the calculations of the students are first: the estimation of the cost of the theoretical amount of the ideal product and then the multiplication of this amount by the percentage value of their individual product. This has been found a simpler method of computation than having each student figure out the cost of the amount of product obtained by him based on its special strength. After the cost of the ideal product has been computed from market values, the student prepares a bill for the goods (*Exhibit F*) and is paid by check (*Exhibit G*) which is forthwith deposited and entered in the students "bank book," thus giving a chance to discuss the depositing phases of banking. Each product as made is thus billed, paid for by check, and deposited, so that at the end of the year each student who makes the entire list of preparations has a sum to his credit in his bank book that is more than enough to pay the "note" he gave when the set of chemicals was sold to him. Obviously, the student who has the largest balance in bank after paying his note, is considered as making the highest record in class work. A list of the highest and lowest values obtained during the past session is appended.

			Ideal		Highest Student		Lowest Student	
			Amount.	Percent.	Value.	Percent.	Value.	Percent.
Solution of Soda.....	250 Gm.	100%	\$0.083	86%	\$0.072	82%	\$0.067	
Solution of Chlorinated Soda	100 Cc.	100%	\$0.010	80%	\$0.008	80%	\$0.008	
Effervescent Magnesium Citrate .....	47 Gm.	100%	\$0.063	60%	\$0.038	90%	\$0.057	
Ammonium Iodide.....	13 Gm.	100%	\$0.147	100%	\$0.147	ruined	\$0.000	
Precipitated Chalk.....	12 Gm.	100%	\$0.003	100%	\$0.003	100%	\$0.003	
Syrup of Lime.....	100 Cc.	100%	\$0.126	82%	\$0.103	80%	\$0.100	
Solution of Ferric Citrate..	25 Cc.	100%	\$0.016	100%	\$0.016	86%	\$0.014	
Scale Ferric Citrate .....	13 Gm.	100%	\$0.017	65%	\$0.011	30%	\$0.005	
Solution of Ferric Sulphate.	50 Gm.	100%	\$0.022	90%	\$0.020	90%	\$0.020	
Solution of Zinc Chloride..	50 Gm.	100%	\$0.020	100%	\$0.020	85%	\$0.017	
Mass of Ferrous Carbonate.	22 Gm.	100%	\$0.015	90%	\$0.014	85%	\$0.013	
Syrup of Ferrous Iodide....	100 Gm.	100%	\$0.075	85%	\$0.063	77%	\$0.057	
Solution of Lead Subacetate	100 Gm.	100%	\$0.033	75%	\$0.025	63%	\$0.020	
Lead Plaster.....	58 Gm.	100%	\$0.052	65%	\$0.033	60%	\$0.030	
					\$0.682	\$0.573	\$0.411	

NOTE.—Drawn to cover cost of goods \$0.37.

The outline given is suggested merely as a basis of the work, and can be elaborated to suit the time that can be taken from the regular schedule. If time can be spared, all other details of commercial training, including bookkeeping, could be introduced.

*Pharmaceutical Laboratory, Cleveland School of Pharmacy, Aug., 1908.*

## EXHIBIT A.

Oct. 17, '06.

*Central Drug Co.:*

Deliver to bearer the following:

45 Gm. Sod. Carbonate,  
 20 Gm. Lime,  
 30 Gm. Ammonia Water,  
 30 Gm. Sulphuric Acid,  
 15½ Gm. Potassium Iodide,  
 7½ Gm. chlorinated Lime,  
 5 Gm. Magnesia Carbonate,  
 50 Gm. Citric Acid,  
 15 Gm. Sod. Bicarbonate,  
 60 Gm. Sugar,  
 12 Gm. Zinc,  
 45 Gm. Hydrochloric Acid,  
 25 Gm. Nitric Acid,  
 0.6 Gm. Zinc Carbonate,  
 85 Gm. Ferrous Sulphate,  
 8 Gm. Card. teeth,  
 5 Gm. Iodine,  
 17 Gm. Lead Acetate,  
 26 Gm. Lead Oxide,  
 30 Cc. Olive Oil,  
 3½ Gm. Rosin,  
 2 Gm. Yellow Wax.

A. H. WINGER.

The Order.

## EXHIBIT B.

Oct. 17, 1906.

O. E. ALBER.

Bought of Central Drug. Co.

45 Gm. Sodium Carbonate @ \$.19 av. lb. ....	.019
20 Gm. Lime @ \$.05 av. lb. ....	.0022
30 Gm. Ammonia Water @ \$.08 lb. ....	.0053
30 Gm. Sulphuric Acid \$.13 av. lb. ....	.0087
15.5 Gm. Pot. Iodide \$3.00 av. lb. ....	.1033
7.5 Gm. Chlorinated Lime 35 cts. lb. ....	.0058
5 Gm. Magnesium Carbonate 17 cts. lb. ....	.0019
50 Gm. Citric Acid \$.54 lb. ....	.06
15 Gm. Sodium Bicarbonate 5 cts. ....	.0016
60 Gm. Sugar @ 6 cts. ....	.0080
12 Gm. Zinc @ 40 cts. ....	.0107
45 Gm. Hydrochloric Acid @ \$.15 lb. ....	.015
<b>Total</b> .....	.2415
25 Gm. Nitric Acid @ \$.15 av. lb. ....	.0083
0.6 Gm. Zinc Carbonate @ \$.23 ....	.0003
85 Gm. Ferrous Sulphate @ \$.10 ....	.0188
8 Gm. Card. Teeth @ \$.10 ....	.0018

5 Gm. Iodine @ \$3.20.....	.0355
26 Gm. Lead Oxide @ \$ .75 .....	.0433
30 Cc. Olive Oil \$1.28 Gal. ....	.01
3.5 Gm. Rosin @ \$ .5 av. lb.....	.0004
2 Gm. Yellow Wax @ \$ .30 .....	.0013
17 Gm. Lead Acetate @ \$ .22.....	.0083
Total .....	.1280
	.2415
Total .....	.3695
	==
The Bill .....	\$ .3695

## EXHIBIT C.

OCT., 24, '06.

On demand I promise to pay to order of Central Drug Co., Thirty seven cents.  
 37/100  
 The Note. O. H. GRAHAM.

## EXHIBIT D.

CLEVELAND, JAN., 2, 1906.

Received of James Blank, 250 grammes Solution of Soda. Credit for which will be  
 given after analysis.

CLEVELAND JOBBING CO.  
 Per J. H. K.

The Receipt for Finished Goods.

## EXHIBIT E.

Report. Name. Chas. Stewart.  
 Sample Syrup Ferrous Iodide.  
 Amount 80 Cc.  
 Free Iodine Test O. K.  
 1.54 Gms. takes 1.2 Cc. of  $\frac{N}{10}$  KSCN Vol. Sol.  
 The value of this is about 90 per cent. of the market price.

Analyst,

A. W. CANFIELD.

Report of the Analysis.

## EXHIBIT F.

JAN. 23, '07.

Central Drug Co.

Bought of

O. H. Graham.

50 Gm. Ferric Sulphate Solution @ .022 .....	×	95%	.0209
50 Gm. Zinc Chloride Solution @ .02 .....	×	84%	.0168
			-----
			.037

Jan. 30, '07.

Rec'd payment,  
 O. H. G.

Bill of part of finished goods.



## EXHIBIT G.

CLEVELAND, 12-17, 1906.

*The Main Bank of Cleveland :*

Pay to the Order of M. K. Gerard,

Ten 5/10..... Cents.

CLEVELAND JOBBING CO.,

\$0.105.

Per T. M. B.

Check for goods.

The Chair called on Mr. Hynson to discuss these papers.

Mr. Hynson said he wanted to congratulate the Chair on the introduction of this plan of discussing papers. The general plan he would commend, although mistakes may be made as to the individuals selected. He thought the members should assist in making the plan a success.

Mr. Hynson said that the gentleman who had presented the paper was an illustration, himself, of the advantage of coupling a little common sense and business sense with professional attainments and scientific acquirements, and he thought he illustrated the force and necessity of commercial training. The profession of pharmacy, as the author has said, is really an art, a profession and a trade, all in one. He agreed with Mr. Remington about the specialist, and thought he would be all the better for giving a part of his time towards acquiring a business education, as there has really come to be an art and science of business. The scientist or specialist of the old school must indeed be shocked to hear that Harvard has established a chair on the Science of Business. He believed in the all-round man—it was a mark of progress. He thought the papers of Mr. Remington and Mr. Army contained many truths that would not be discovered by the ultra-scientist. He believed in a liberal education, and thought the genius should know something about business, and the business man something about science. The man of the future who succeeds in the battle of life will be a man of energy and education, knowing something of science. The ordinary business man who has to do with affairs will get along better because of a scientific education, and certainly the scientific man with a trade will get along better if he knows something about the science of business. He took great pleasure in endorsing every proposition that Mr. Remington made.

The Chair called on Mr. Lemberger, of Pennsylvania, to speak on these papers.

Mr. Lemberger commended the paper of Mr. Remington, which took him back to his boyhood days, when he had early learned the value of practical experience in business affairs. He told the story of his first experience in business, after leaving the parental roof. He thought Mr. Remington had struck the key-note when he went over the professions—

except that he ought to have excepted the lawyers, that was the only weak point in his paper. Mr. Arny's paper and Mr. Remington's both referred to vital points in the coming pharmaceutical education. He wanted to say, as Mr. Hynson did, that he realized the great advantage to the Section in having made some sort of preparatory arrangements for the discussion of papers. It was the beginning of this very system of training. The principle, therefore, applied to the Section as well as to the professional pharmacy, or to law or theology. He thought the pharmaceutical profession was awakening to a realization of the fact that a well-rounded preparation for the work, as Mr. Hynson had said, was imperative.

Mr. Mason next discussed the paper, and said he was struck with the thought, as Mr. Remington read his paper—a thought that had often occurred to him—that the business man of America is the most typical product of the nation. Our professional men in various capacities are not in the lead of professional men of other countries, and probably not as well trained in some professions, at least, as are the professional men in some other countries. But America leads the world in the fine quality of its business men. It is pre-eminently a business nation, and our universities are finding it out—not only Harvard, but the Michigan and Wisconsin and California universities, and several others, that have established commercial courses. It is realized to-day that a man needs just as much training for this—*profession*; he used the word advisedly—of business and commerce, as law or theology or any other profession that might be named.

What is true of business in general is increasingly true of pharmacy, because pharmacy is both a profession and a business. The pharmacist is perhaps fifty per cent. professional man and fifty per cent. business man; in some instances, twenty per cent. professional man and eighty per cent. business. Certainly the business element is predominant in the practice of pharmacy as we find it to-day. But what of these percentages in pharmaceutical education? Is as much emphasis placed upon commercial as professional instruction? Even in pioneer institutions along this line—like that Mr. Remington represents—perhaps ten or fifteen per cent. might be said to give commercial instruction. Possibly fifteen or twenty per cent. out of the ninety mentioned by the Chairman this morning give commercial instruction; the others are absolutely without it, and even the fifteen or twenty per cent. do not give it the proper emphasis. The time is coming when we are going to educate practical pharmacists in our colleges of pharmacy, giving as much emphasis to the science of business as to pharmacy. Competition is getting stronger and stronger every day, and it is becoming increasingly harder for a man to succeed in any line of effort; and this is especially true of the drug business, because as it is now being conducted in our larger cities, it is along lines which call for the most perfect business methods. We have groups of stores like the

Evans stores in Philadelphia and the Riker stores in New York, and the methods used in these houses are in correspondence with the best business methods of the corporations of the country. So, if the independent druggist is going to meet that competition, he must do it by thorough business methods. Nine druggists out of ten, in the speaker's experience, were not properly prepared to know whether they were making money or not; they do not keep a set of books involving business accounting, so they would know the condition of their business and know whether they were making money or not. He believed the colleges of pharmacy would ultimately have to adapt themselves to changed conditions. The teachers may say they have not the time, but the time will have to be made; perhaps the course will have to be lengthened to three years, as in Philadelphia. We do not now place as much emphasis on Greek and Latin in the universities as formerly. Mr. Lemberger would perhaps remember when the three classical studies in universities were theology and law, and the Greek and Latin languages. To-day our university courses are greatly extended, as it has become necessary to do a great many things formerly thought unnecessary; and that may be true of pharmaceutical education. The time has come when the college of pharmacy will have to place just as much emphasis on business as the pharmacist himself has to show when he goes into business.

The Chair here gave opportunity to Mr. Hynson to make announcement of a meeting of the Committee on Re-organization at 8:30 p. m. tomorrow, to which meeting Mr. Hynson invited all those interested in this subject, whether they were in favor of or opposed to the plan of re-organization; he said it was an open meeting, and he wanted the members to come and discuss it.

The Chair announced that the Special Committee on Temperance provided for at the morning session—a Committee on Temperance in its Relation to Pharmacy,—would be composed of the following: Harry B. Mason, of Detroit, Lucius E. Sayre, of Kansas, George F. Payne, of Georgia, Philip Asher, of New Orleans, and F. W. Meissner, Jr., of La-Porte, Ind.

The Chair stated that the next paper was one on Pharmacopœial Nomenclature, by Mr. Whelpley, of St. Louis.

Mr. Whelpley presented his paper as follows:

#### PHARMACOPŒIAL NOMENCLATURE.

BY HENRY M. WHELPLEY.

Those who have had the opportunity of following the discussions on nomenclature of the committee on revision of the United States Pharmacopœia realize that the adoption of some of the names depended upon a

matter of opinion while a few are the result of mere choice ; but the general trend of pharmacopœial nomenclature is in keeping with the present usages in our best botanical, chemical and zoölogical literature. It is the nomenclature of educated pharmacists and, what is more, it is the nomenclature of the only legal standard for the pharmacist of this country. It is found in our text and reference books and taught in the colleges of pharmacy. It is required by some boards of pharmacy of candidates for registration.

The adoption of pharmacopœial nomenclature does not, as yet, extend to every branch of the pharmaceutical calling. It is ignored by many of the manufacturers and jobbers and recognized in only a half-hearted way in the price-lists while many of the sets of examination questions issued by boards of pharmacy indicate gross carelessness in nomenclature. The incorrect packing bottle and package labels are familiar to all of us. The average price-list of to-day lists boric acid under "acid, boracic" and phenol as "acid, carbolic," without mention of phenol. Colchicum is found under "roots" and opium as a "gum." These conditions are very perplexing to the college student who has studied the nomenclature of the labels and the price-lists and finds it more difficult to forget them than it was to become familiar with the incorrect titles.

When the report on Drug Market was presented at the 1887 meeting, I criticized the nomenclature but was promptly informed that the report was in the language of the trade and according to the precepts of our fathers and that I was out of order. By reference to the volume of proceedings for that year, you will find copaiba classed as a balsam, aloes and opium as gums and so on down the list. The A. Ph. A. has advanced during the past twenty-one years and now follows the pharmacopœial nomenclature. I trust this paper will not be ruled out of order, but that the sentiment of this Section of the A. Ph. A. will favor the adoption of the following resolution :

*Resolved*, That the American Pharmaceutical Association in fifty-sixth annual session assembled, requests the manufacturers and jobbers of the drug trade, the publishers of price-lists and the boards of pharmacy to adopt the pharmacopœial nomenclature. That we urge them to discontinue the use of such meaningless or incorrect titles as oil of vitriol, muriatic acid, iodide potash, coal tar creosote, carbolic acid, gum opium, etc.

Mr. Whelpley moved the adoption of the resolutions offered in connection with his paper, and that the Association in general session be asked to instruct the General Secretary to send a copy of said resolutions to each pharmaceutical journal in the United States, with the request for its publication. This motion was seconded by Mr. Sayre and Mr. Remington, and the Chair put the vote on the resolutions with this suggestion, and they were adopted, and the Chair said that they would be referred to the General Session for confirmation, accordingly.

The Chair said that if there was no discussion on this paper that Mr. Sayre would present his paper on the subject of the Value of Pharmaceutical Advisory Boards to State Boards of Health. Mr. Sayre read his paper as follows :

#### THE VALUE OF PHARMACEUTICAL ADVISORY BOARDS TO STATE BOARDS OF HEALTH.

BY L. E. SAYRE.

Glancing over the reports of the proceedings of the various state pharmaceutical associations of the present year it may be noted that one of the themes discussed, of much interest to the pharmacists of the country, relates to the proper representation of pharmacists upon boards controlling the execution of the food and drugs law. In some quarters it has been urged that boards of pharmacy should have entire control, in the execution of the drug-end of the food and drugs law, or, so far as the drugs and food law applies to pharmacy. Numerous arguments have been advanced to show the injustice of what has been termed by some as "taxation without representation."

With a view, simply, of bringing this matter forward for discussion, I shall venture to suggest that the prevailing idea, in some localities, that pharmacists should control the execution of the pure drugs law, is one, which, if carried out to its logical conclusions, would in the end, be extremely unfortunate for the pharmacist.

For the pharmacist to have such a controlling influence in the boards of health—an influence that would measurably dictate the policy of the board, so far as pure drugs and their adulteration are concerned—would in our opinion be quite unsatisfactory. It is true, the pharmacist's familiarity with the requirements of the drug business renders it possible for him to enforce the law with common sense and fairness, but fairness, justice, etc., is not impossible should the pharmacist not have power himself to execute the law. He would always be liable to the accusation of being generously disposed toward his profession, rather than be anxious for fairness and justice to the public—the public, it must be remembered, is theoretically the primary consideration in both the Pharmacy, and Food and Drugs Law.

The law creating the State Board of Health in one state at least (Kansas) specifically prescribes the qualification for membership on this Board in the following language : "The members shall be physicians from different parts of the State, who shall be men of good moral character and temperate habits, distinguished for their devotion to the study of medicine and allied sciences, and not less than seven years' continuous practice in their profession, and each of whom shall be a graduate of a reputable medical college." Under our present laws then the eligibility for mem-

bership on the State Board of Health excludes any other than physicians who are distinguished for their devotion to the study of medicine and allied sciences. A later provision of the law in Kansas indicates that the Governor shall appoint an attorney who shall confer with the State Board of Health upon legal matters.

The duties of the State Board of Health in the above state, as well as every other state and territory in this and every other country, are embodied in this almost universal phrase: "The Board shall have general supervision of the health of the citizens and endeavor to make intelligent and profitable use of the collected records of the causes of sickness and death among the people. They shall make sanitary investigations and inquire concerning the causes of disease, and especially of epidemics, the causes of mortality and the effects of locality, employments, conditions, food, water supply, habits and other circumstances upon the health of the people."

It will be seen, therefore, that the duties of the Board are exceedingly numerous and comprehensive, and that their inquiry into the matter of food and drugs is only one of the many important functions for which state boards of health are created. The education of the physician is such as should eminently qualify him for undertaking all the duties prescribed under the law, and it is fair to assume that there is no other profession that presumes to be so skilled along the lines above enumerated.

The pharmacist is not professionally concerned about epidemics and endemics, the water supplies, disposal of sewage and excreta, the heating and ventilation of public buildings, the causes of mortality, etc. It must be apparent at once that the services of a pharmacist on the State Board of Health would be practically valueless in nearly everything excepting such matters as relate to his own profession. The consideration of drug adulteration and misbranding takes but a small portion of the time and deliberation of a board which has to do with the public health, and experts in drugs are employed to handle the technical questions relating thereto.

Then again the food and drugs law does not pretend to regulate the practice of pharmacy. That matter is covered by an entirely different statute, namely, the State Pharmacy Law, and in those matters it is very proper that only pharmacists be permitted to enforce that law which regulates the practice of pharmacy. The Food and Drugs Law only touches the pharmacist in that it forbids him to sell adulterated or misbranded drugs, and we apprehend that a pharmacist has no moral right to insist on control of a body that has charge of the enforcement of a criminal law against these matters than the railroad has a right to demand that the Board of Railroad Commissioners be represented by men who are actually engaged in the management of railroads. We feel that it would be quite absurd if one should argue with a pharmacist that our State Board of Railroad Commissioners should be composed of, let me say, general attorneys representing

the various Railroads. Moreover, if by any legitimate reason it is made to appear that pharmacists, with authoritative powers, should be represented upon the State Board of Health by reason of the Food and Drugs Law, by the same token the grocery men, the ice-cream men, the packing-house industries, the vinegar manufacturers, and the confectioners, hotel keepers, bottlers and all others whose business is presumed to be regulated in so far as misbranded and adulterated goods are concerned, should have a similar representation on the board. And we believe in order to be just and fair, which we believe is the main point to be urged, the grocers should have their proportionate representation of say five times as many as the druggists, and thus, in order to have all these different parties represented, the health board should then consist of something like a hundred members probably.

Then it occurs to us that the board has the enforcement of a number of other laws; take for example the Water and Sewage Law. The same reasoning would seem to indicate that constructing engineers, contractors and manufacturers of water and sewage paraphernalia should also have representation, and thus we might continue the matter indefinitely, all of which goes to show how unreasonable and even absurd is the proposition of pharmacists having a controlling representation on the Board of Health.

The error made by those who insist on absolute control by Boards of Pharmacy is probably the misconception of the law itself; *they assume that the Food and Drugs Law regulates the practice of pharmacy, when such is not the case*; it would be folly for the Board of Health to assume such a responsibility.

It seems to us that the proper thing for the pharmacists to contend for is a fair, just and proper representation upon the Board of Health, such a representation as is obtained in the State of Kansas, for example.

We suggest as a general resolution that: "*The State Boards of Pharmacy in those States having food and drug laws analogous to the national law, be requested to offer their services to the State Board of Health as an 'Advisory Board' in pharmaceutical matters.*"

The pharmacists in Kansas thus far have been most generously represented in this way, and they are likely to have more, as fairness and justice may demand. This representation is to be brought about by the harmonious action of the Board of Health and the pharmacists of the State. We contend that this is the most wholesome kind of reform when reform is needed, a reform that is brought about by harmonious action rather than contention. In Kansas the Board of Health has attached to it as far as possible an Advisory Board representing the different professions and commercial interests. When any matters come up that seriously affect the pharmacist, a committee composed of representative pharmacists is called in for consultation, and a pharmacist is a member of the Advisory Board.

We may be in error, but we are of the opinion that pharmacists should

be represented on Advisory Boards *in connection with Boards of Health* rather than that the Boards of Pharmacy should assume control and assume the responsibility of the execution of the drug end of the Food and Drugs Law.

This paper, it must be kept in mind, is only for the purpose of promoting discussion upon this very important question rather than in the hope of deciding or bringing to immediate decision the question involved.

The Chair called for action on the paper just read, and asked if there was any discussion. He stated that Mr. Beal and Mr. Godbold were to discuss this paper, but both these gentlemen were absent.

Mr. Searby, of California, said that, in the absence of the gentlemen assigned especially to the discussion of this paper, he would like to say a few words himself. He was not in accord with the views of the writer of the paper, in some instances, at least. Boards of Health are almost always constituted of physicians. These bodies are usually made up of men having a political pull, and a political doctor is no friend to the druggist. He will "knock" him every time. To have a Food Adulteration law in the hands of persons absolutely unfriendly to the druggists is a danger to pharmacists. He was not prepared to say that State Boards of Pharmacy should have entire charge of this business, but he could see no reason why a State Board of Health, which has to look after all kinds of matters connected with sanitation—plumbing, ventilation, and things requiring the services of architects, engineers, and all sorts of people, besides pharmacists—should be constituted entirely of physicians; and in those parts of the country in which there is not a cordial relation between the physicians and pharmacists over the administration of the pure food laws, why place in the hands of a body of men in a large measure unfriendly to pharmacists the administration of such laws? It would be a serious injury to the body of pharmacists for that to be done. It is all right that physicians should be represented on Boards of Health, of course, but there should be associated with them men of well-known legal ability, who know the laws, to keep them from making blunders; and certainly if the execution of the Pure Food and Drugs Law is to be left to such a board, the pharmaceutical profession should be represented on that board, as well as the profession of medicine. In California, the Pure Food Law is one thing and the Pure Drugs Law is another. The Board of Health is made the administrator of both laws. The pharmacists there are going to make an effort at the next session of their legislature to change that condition, because they are not willing to trust their fortunes entirely to a board of health constituted as it is there of political men connected with one profession, and some of them generally believed to be unfriendly to pharmacists. Despite its composition, however, the State Board of Health has done a great deal of good in that State in the past



year, and so have the city health boards. Conditions in the city of San Francisco have been altogether satisfactory, and they have been made the victims of a needless scare there about the Bubonic Plague, and there has been a lot of money needlessly spent, and probably some graft.

If the administration of pure food and drug laws is to be placed in the hands of the board of health it should never be constituted of all pharmacists, or all doctors, or all lawyers, but an admixture of the professions, and of men possessing special fitness on certain lines.

The Chair stated that the next thing on the program was a paper by Mr. G. H. Meeker, of Pennsylvania, on the subject of a practical plan for bringing the pharmacist and physician closer together. Mr. Meeker was not present, but Mr. Vanderkleed, of Philadelphia, at the request of the Chair, read the paper.

#### THE NEXT STEP—A PRACTICAL PLAN FOR THE PROFESSIONAL ADVANCEMENT OF PHARMACISTS.

BY GEO. H. MEEKER, PHAR. D., LL. D.

The advances that have been made in recent years in pharmaceutical ethics, in the traffic in patent and proprietary medicines, in the legal registration of pharmacists, in the regulation of schools of pharmacy, in the materia medica, in the U. S. Pharmacopœia and National Formulary, in the coöperation along limited lines of the American Medical Association with the pharmacist, and by the enactment of state and federal pure drug laws, constitute the results that have been achieved for the pharmacists of to-day by their individual and concerted efforts toward the highest standards. Great indeed have been the advances and most hopeful are the signs that the influences now at work are potential for continued and accelerated good results. But it is disappointing to reflect that practically every advance is along commercial lines and calculated to make the apothecary a successful merchant rather than a member of a skilled and dignified profession. Indeed it seems justifiable to go further and to say that while pharmacy has been advancing commercially, it has been as steadily declining professionally, and perhaps no single criterion so clearly justifies this conclusion as does an examination of the various editions of the United States Pharmacopœia. Note how the older editions consisted largely of directions for the preparation of drugs and medicines, whereas the latest is largely but a list of official medicinal agents, with descriptions of tests for their identity, purity and strength. The State Pharmaceutical Examining Boards, when impartially conducted, do a splendid work for professional pharmacy. Under such boards no pharmacist can be licensed until he has conformed to truly professional standards. Unfortunately, however, the pharmacologic erudition so laboriously acquired by the candidate for licensure, is mainly employed by him in securing registration. The average new licentiate proceeds to purchase his medicines rather than

to prepare them; beyond prescriptions, extemporaneous preparations, toilet preparations and household specialties, his pharmacy falls into disuse; his pharmacognosy is ignored; and he neglects even to employ his chemistry in applying the United States Pharmacopœia tests to his drugs and medicines, which he buys from the manufacturer and sells to the public without knowledge of his own that they really conform to the legal and ethical standards.

In early times it required experience, skill, intelligence and learning to be a successful and ethical apothecary, and such a one was in every sense a professional man. To-day the manufacturing pharmacist has absorbed the greater portion of that which is truly professional in pharmacy, while the pharmacopœia furnishes to the apothecary simply an official list of drug-market commodities. If the next edition of the pharmacopœia contained price lists, the commercial picture would be complete.

There is no hope for alteration in this condition of affairs. The condition exists because it is right. No man and no combination of men could have produced this condition by mere fiat and it is equally impossible for fiat to alter the condition. In all of the affairs of men evolution is irresistibly at work, and an evolution has produced the condition which the present Pharmacopœia and the average apothecary mirror. Large manufacturing establishments can, for the most part, furnish the druggist, at lower prices, with better authentic goods than he himself could produce, assay and guarantee. The inevitable result is that the druggist of to-day purchases finished products rather than raw materials as did the apothecary of yesterday. It is obvious that a large manufacturing establishment, conducted on ethical lines, employing a complete corps of specialists, buying raw materials to the best advantage and by assay only, making preparations on a large and intelligent technical scale and testing and assaying the finished products, does a work that is too immense in its scope for the individual apothecary. What the individual apothecary can do is to search out the many unethical manufacturers, to expose their vicious methods to public scorn and to taboo them without mercy. In this work the pharmacist is now receiving such unqualified support from the American Medical Association and the United States and State governments that abuses by the manufacturer are rapidly diminishing and promise soon to be eliminated.

Despite the foregoing facts, we need not conclude that the process of gradually making a mere merchant of the druggist must go on to completion. It is submitted that the time is ripe for the American Pharmaceutical Association to initiate a movement that will, within a few years, surely enable the progressive druggist to embrace an avocation that will be a profitable, dignified and agreeable combination of the mercantile with the truly professional, and will be so recognized by the professional and lay public. Let energies not be wasted in mournful comparison of the lumi-

nous past with the sordid present, nor in vain caviling and futile battling against business conditions that are only the inevitable effects of the natural laws of commerce. The policy of pharmacy should be constructive and not re-constructive, and just as the noble but obsolete Kearsarge of yore is now succeeded by the greater Kearsarge of to day, so should the now obsolete drug-store idea of our fathers be succeeded by a new and greater drug-store idea of their sons.

The crux of the whole matter is in the laboratory of the drug store, for the reason that the only professional work done by the apothecary is the work he does in the laboratory. Our fathers were professional men because they were laboratory men. Into the drug-store laboratory came their raw materials, and from the laboratory issued those finished products that represented the labor, thought and pride of the apothecary and bore the vital stamp of his individuality. To-day the rule in pharmacy is as the rule in every other industry. Large specialized factories are producing the best goods at the lowest prices, and the traditional drug-store laboratory is a cherished memory of the older pharmacists with which they delight to taunt the novice of to-day.

True, we have a recrudescence of activity through the propaganda for National Formulary preparations and against proprietaries, but the field is narrow, and in so far as concerns the drug-store laboratory, methinks like the sudden brilliant flaring of an expiring flame. If Blank's cryptic concoction be replaced by its N. F. equivalent, and the demand for the N. F. preparation be profitable, then in the end the net result is Blank's loss of his business and the druggist's purchase of the N. F. preparation from his favorite factory. Such are the unsympathetic ways of commerce, and we must, in this case, be content that we have accomplished the elimination of Blank with a corresponding improvement of the physician's ethics.

Our present remnant of the drug-store laboratory is, as in the past, essentially a manufacturing laboratory. It is of limited and rapidly vanishing scope because the small local laboratory man cannot successfully compete with his rivals, the great and highly-organized factories.

There are but three phases of laboratory work : manufacture, research and analysis. The only hope of great things for the drug-store laboratory is in research and analysis. The scope of this work must be pharmaceutic, clinic, chemic, bacteriologic, pathologic and physiologic. Obviously it will be many years ere the apothecary, as a laboratory man, will enjoy valuable fruits of his work along all of these lines. The apothecary must himself be educated ; his natural clientele must be made aware of his value to them, and his laboratory methods must be standardized, amplified and corrected.

Many pages could be written upon the absorbing theme of the possibilities of pharmaceutic research and analysis. But such words, even though glowing with the fire of genius, would be barren of practical value

at the present time. The only thing of immediate practical value is that we shall recognize the goal we should achieve, shall turn toward it with a cheerful optimism, and shall exert every energy in journeying to it along those pathways which are lines of low resistance. The only lines of low resistance for the druggist are those lines along which he can have pecuniary gain.

Fortunately two such pathways have been made ready for him. The barriers that close these pathways are so frail that they will scarcely produce even a temporary halt in any intelligent and concerted march made upon them by American pharmacists. These pathways are clinical laboratory work for physicians and food and drug inspection work for the public service.

To-day the practice of medicine without laboratory aid is dishonest to the public. Every physician is now taught that laboratory examinations of urine, sputum, blood, tissues, milk, fæces, gastric contents, etc., are necessary to the enlightened practice of medicine. The day of "How do you feel," "Let me see your tongue," "I'll feel of your pulse," and "Here's a prescription"—with a mental "We'll see how it acts, give something else if it does no good, and meanwhile 'dope' the pain"—should be behind us. Man's medical learning has long since passed the haphazard stage, but unfortunately the public is not generally aware of the fact. The public is being awakened, however, by conscientious medical men, and very soon it will demand from every physician a service that the busy medical practitioner has no time to furnish. Indeed, through lack of practice the successful physician soon becomes unfitted for laboratory work.

The pharmacist is the one who should naturally do the laboratory work of the physician. The public must pay the bill, and it will do so cheerfully when properly educated.

Up to this point we have dealt in facts that have no novelty. The conditions cited have been recognized continuously by pharmacists and physicians with speech and pen, but generally in a spirit of hopelessness. It is submitted that the situation is full of hope, and that the time is ripe for the American Pharmaceutical Association to adopt the plan now to be outlined and thus to inaugurate a movement that will be as seed planted in fertile ground. The plan is based upon the coöperation of the American Pharmaceutical Association and the American Medical Association in examining and certifying clinical chemists; in establishing the official laboratory standards; in adopting a special code of ethics; in educating the public; and in demanding from national, state and local governments the recognition of the principle that physicians and pharmacists contribute the intelligent public opinion regarding the purity and wholesomeness of foods and drugs.

The plan is as follows :

1. Let the A. Ph. A. appoint a special committee and invite the A. M. A. to appoint a similar committee.

2. Let these two committees combine and organize.

3. Let the combined committees take steps to bring about finally the following state of affairs :

*A.* A national central examining board representing the A. Ph. A. and the A. M. A. will conduct examinations of applicants who desire to obtain the title of "Certified Clinical Chemist" together with the privileges accruing from the same. These examinations will be uniform, will be conducted simultaneously by various local committees and will be modeled after the U. S. Civil Service examinations.

*B.* The examinations will be based upon the "Official Clinical Laboratory Methods"; will be both theoretic and practical; will be rigid, searching and impartial; and will require a high proficiency, say 90 per cent., for success.

*D.* The successful applicant will be entitled, conformably with the "Official Code of Ethics," to make himself known to the public and profession as a "Certified Clinical Chemist" (or by some other suitable title).

*E.* The "Official Clinical Laboratory Methods" will have been formulated and adopted by authority of the A. Ph. A. and the A. M. A.

*F.* The "Official Clinical Laboratory Methods" will be subject to criticism and periodic revision and amplification through the automatic operation of an officially prescribed procedure for this purpose.

*G.* There will be special sections upon clinical laboratory methods at the annual meetings of the A. Ph. A. and the A. M. A.

*H.* Special attention will be paid in the "Bulletin" of the American Pharmaceutical Association and the "Journal" of the American Medical Association to this new movement.

*I.* There will be a joint standing committee of the A. Ph. A. and the A. M. A. to take special charge of a propaganda of education of the medical, pharmaceutic and lay public—that the physician may feel it his duty systematically to employ the certified clinical chemist; that the pharmacist may equip himself and his pharmacy for clinical laboratory work; and that the lay public may become alive to the necessity of laboratory information in the diagnosis, prognosis and treatment of disease.

*J.* The A. Ph. A. and the A. M. A. and the various state pharmaceutic and medical societies will have, by concerted efforts, completed such arrangements with the national and state governments, that properly certified druggists will be employed in caring for a portion of the colossal volume of detail laboratory work of food and drug inspection, etc., demanded by an efficient enforcement of the multitude of public health laws for the control of foods, drugs, hygiene and sanitation.

In commenting upon the proposed plan, the following statements are believed to be true :

As conditions exist in the immediate present, a druggist has little or no chance of obtaining laboratory work and the majority of pharmacists are not truly competent in the premises. Pharmacists certified as proposed would have the entire confidence of the medical profession and would be employed by physicians without hesitation. Such confidence does not now exist. It must be created as proposed—and once created, the negligent physician will have no defense before his professional brethren and before his patients. There is a large number of enlightened medical men who would hail this movement, enthusiastically advocate it, and rapidly bring accessions to the ranks of its supporters.

The official clinical laboratory methods should be pathologic and bacteriologic as well as chemic—though, in the beginning, the work along these lines should be of a limited and strictly practical character.

In each semi-rural community at least, the certified chemist would gradually secure a patronage for the minor analytic wants of the multitude. These wants are not now supplied, save occasionally by the distant city chemist.

Finally, while it is freely admitted that present conditions do not justify druggists in establishing laboratories, it is nevertheless asserted with confidence that the time is opportune for the clearing away the last obstacles; that the druggist is not fully prepared to handle the laboratory work; that he must so fit himself; that the A. Ph. A. can now start a successful movement; that the successful culmination of this movement is the only means now visible for the truly professional advancement of the druggist; that this advancement having been made, will bring the druggist and physician into closer touch, sympathy and mutual respect than ever before; will do wonders in the way of reforms in counter prescribing, re-filling of prescriptions, the furnishing of medicines to patients by physicians and the elimination of the *nostrum vendor*; will greatly elevate the druggist in the eyes of the general public; and will, as a reflex effect, immensely benefit the apothecary in the purely commercial aspects of his calling.

Commercial history demonstrates that, in the long run, high ideals combined with quick grasp of new conditions go hand in hand with business success.

*Medico-Chirurgical College, Philadelphia, Pa.*

Mr. Eberle, of Texas, first discussed the paper, at invitation of the Chair. He said he was thoroughly in sympathy with the subject. To a very large extent, though, he thought it an idealization of the subject, and more theoretical than practical. He thought work on this plan would have to be begun nearer home; that the druggist must begin with what might be called post-graduate work at home, in his own town and among his own physicians, and with his local association and the association of his district, and then with the State association. This work should be

begun by establishing a system of practical work along this line with the local pharmaceutical association, and then the local association should meet with the local medical association having the same idea in view, and by conducting and actually doing laboratory work along this line.

Coming to the State pharmaceutical associations, Mr. Eberle said that he thought that instead of having so many papers on subjects that are very often largely theoretical, if the time was devoted to actual laboratory work—that is, doing the work by those who have had the experience and are capable of teaching—a large number who have never had any experience and do not know how to do such work would be aided greatly, and it would place the druggist in position to receive the advantages suggested by the author of the paper.

As he understood the various sections of the resolutions presented, he thought it would require considerable time and study before such a proposition could be arranged for, although he would like to see such a plan established. The time is coming when there will be a decided change, so far as pharmacy is concerned. If advantage is taken of conditions as they exist now, pharmacy can be greatly improved, and it can be brought nearer to the ideal that all desire. But if pharmacists do not take advantage of their opportunities, and do not qualify themselves for the advantages which are now within their grasp, the opportunity will be lost, and the profession be relegated to a trade entirely, as the writer suggests.

The main suggestion that appealed to Mr. Eberle in the paper was, that in order to accomplish anything the pharmacist must actually do things, and that in order to finally succeed he must not attempt these things superficially, but must lay the foundation good and strong, so that results will be lasting and substantial.

Mr. Hallberg, discussing the paper, agreed thoroughly with what Mr. Eberle had said. This was an elaborate scheme of the author's, and he doubted whether the pharmacists of this Association could undertake any such program at the present time. That there was much in the plan, however—that it gave food for thought—he considered quite evident. He believed that if the interest in pharmaceutical work which has been created during the last two years should continue to increase in the same ratio, in a comparatively short time they might be able to take up a matter of this kind. Meanwhile, he believed that the local branches particularly—not only in the local branches as they now exist, and where there may be branches formed, but also in other localities—post-graduate work should be instituted and should be patronized by the pharmacists. Take the man that graduated ten or fifteen or twenty years ago: by this time he has forgotten all he learned, nearly, and has had no opportunity to make anything but a few of the most simple preparations. Everything else has come to be ready-made, because so specified by the physician, and the result has been the disappearance, to a large degree, of the pharma-

ceutic art and practice. But it is different now. He was surprised to see from unexpected quarters evidences of revived interest in pharmacy. He believed that the branches should offer the druggists in the large cities an opportunity of devoting their spare time to post-graduate work: it would be interesting to them, and certainly it would be a benefit to them in more ways than one. The Philadelphia branch has already arranged for something of that kind at the next session and he hoped that his own branch in the city of Chicago and other branches, would undertake the same thing. He believed that if there was a committee of three appointed by the American Medical Association to confer with a similar committee of this Association—a sort of conference of the American Medical Association with the American Pharmaceutical Association, by way of these committees—he thought that this subject would not be foreign to the scope of that committee, and that it would be a good move to have this question referred to that joint committee. He so moved. He said the matter could easily lie over for a year, and possibly this committee next year would be able to make a report upon the value of this proposition.

Mr. Wilbert, discussing the paper, said he thought this matter came within the scope of the committee's duties, and in seconding the motion he took occasion to endorse what Mr. Eberle had said about the need for a post-graduate course. There is no more crying need to-day than for the retail pharmacist to come in contact with the progress that has been made since he left the college of pharmacy, whether a year ago or ten years ago. Even if he left only a year ago, he would be surprised at the progress along pharmaceutical lines in that time. He was sure that if this matter should be referred to such a joint committee, at the next meeting of this Association the portion of this committee appointed by the American Pharmaceutical Association would have some suggestions to make that would be of far-reaching benefit to the pharmaceutical profession.

Mr. Osseward, of Seattle, said he was glad he was present to hear this paper read, and he would like to give an illustration, based on personal experience, to show how easy it was for the pharmacist to work with the physician: A doctor having a patient with a very bad knee, with the pus spreading rather than growing better, had recently come into his place of business and remarked upon the case. It was evidently worrying the physician, and he was at the end of his rope. He told the speaker that he thought he would use some streptococci serum as a last resort, and asked him what he thought of it. He replied, "Do you know it is a streptococcic infection? If so, certainly I would." The doctor had not examined the pus, so he told him to bring him a sample and he would see what it was. This examination showed it not to be a streptococcic infection at all, but it consisted entirely of the green pus bacilli (*bacillus pyocyaneus*). He at once advised the doctor to use some *pyocyaneus* vaccine, which he did, with splendid results.



We may not do all the things recommended in this paper, but we can do a great deal at once, and work up to it gradually. This is the kind of work, real assistance to the physicians, which will bring the pharmacist closer to the physician; and then there will be less talk about the physician doing his own dispensing, for the pharmacist will get his confidence and along with it his business.

The Hallberg motion, to refer to a joint committee of this Association and of the American Medical Association, three from each body, was then put to a vote and carried.

The Chair stated that Mr. Beringer had promised the Section a paper on the educational value of field botany to the retail pharmacist,—a subject upon which he was exceedingly well informed,—but he had found at the last that he could not prepare this paper and do justice to the other subject he had in hand, and he had been excused.

The Chair then called attention to the fact that nominations for Chairman and Secretary had been made at the morning session, but that it was now in order to nominate three persons for members of the Committee on Education and Legislation for the ensuing year. Thereupon Mr. Hallberg nominated Mr. C. Osseward, of Seattle; Mr. Wilbert nominated Mr. Julius A. Koch, of Pittsburg, and Mr. Whelpley nominated Mr. L. R. A. Suppan, of St. Louis. Mr. Lemberger moved that nominations be closed, and the motion prevailed. The Chair asked if one vote should be cast for all of the nominees, as there was no opposition. Mr. Lemberger, seconded by Mr. Eberle, moved that the Secretary cast the affirmative ballot of the Section electing these gentlemen, and the motion prevailed. The Secretary announced that he had cast the ballot, and the Chair declared them duly elected.

On motion, the Section then adjourned to 8 p. m.

---

#### THIRD SESSION—WEDNESDAY EVENING, SEPTEMBER, 9, 1908.

Chairman England called the Section to order in the conference room of the Hotel Eastman at 8:30 p. m., and announced that the first thing for consideration was a communication handed him by General Secretary Caspari from a member of the Association, Dr. F. E. Stewart, of Philadelphia, which was then read for the information of all present.

DEAR PROF. CASPARI:

You will see by referring to the Druggists' Circular for August, 1908, page 389, the abstract of a paper of mine on the subject of patents and trade-marks which relates to a Resolution offered at the House of Delegates of the American Medical Association and endorsed by the Council on Pharmacy and Chemistry. A Committee was appointed at my solicitation by the State Pharmaceutical Association of the State of Pennsylvania, to confer with the Committee of the American Medical Association.

Dr. Herbert L. Burrell, of Boston, President of the American Medical Association,

informs me that he has appointed as Committee on Patents and Trade-marks the following members:

Dr. Chas. S. Bacon, Chicago, *Chairman*,  
 Dr. Oliver T. Osborne, New Haven, Conn.,  
 Dr. Philip Mills Jones, San Francisco, Cal.  
 Dr. A. B. Cook, Nashville, Tenn.,  
 Dr. H. C. Wood, Jr., Philadelphia.

I would suggest that this matter be brought before the American Pharmaceutical Association at its meeting at Hot Springs, Arkansas, and a Committee appointed for the purpose of cooperating with the Committee of the American Medical Association. The American Pharmaceutical Association during my term of office as Chairman of the Committee on National Legislation, contributed to the subject a large amount of valuable matter as you know, and the Association placed itself on record in the document known as "Preamble and Resolutions," which document was officially adopted by the American Medical Association as the result of the work of the A. Ph. A.

It seems to me that now is the time for the A. Ph. A. to take up this subject and reap the harvest, as the Association did the sowing of the seed. I am willing to cooperate with such a Committee, or to become a member of such a Committee, or to act as Chairman of such a Committee, or to keep my hands off,—it doesn't make a particle of difference to me which. I have certainly done my work in the matter, and it is now up to the Associations, and if they do not choose to handle the subject in such a way as to be to their advantage, they simply have nobody to blame but themselves. This may be written a little strong, but I must say that I am somewhat disgusted at people who spend so much time growling about the patent medicine business and the wickedness of the proprietary system and the abuses of patents and trade-marks, and then when they have an opportunity to do something, they have no more backbone than a cuttlefish. As you and I have talked on this subject before, I think you will appreciate all I have said.

Yours truly,

F. E. STEWART.

Mr. Wilbert suggested that this Section had no authority to appoint such a committee; that the Section would have to recommend to the Association in general session the appointment of such committee, to co-operate with the committee of the other body on patents and trade marks. He made a motion accordingly, and this motion was seconded by Mr. Hemm, of St. Louis, and adopted.

The Chair stated that a letter had just been received from Dr. Hamilton Wright, under date of September 5th, saying that he could not personally address the American Pharmaceutical Association at the Hot Springs meeting upon the opium question, but he would be glad to furnish a statement or paper on that subject later. The Chair then called for action upon this matter, and Mr. Wilbert moved that Dr. Wright be asked to prepare such a paper for presentation at the next annual meeting, as it would be too late to present it at this meeting. This was a vital question, he said, and would be as vital next year as this.

The Chair suggested that the International Commission on the opium question would meet at Shanghai, China, in January, 1909, and Dr. Wright would come back with a lot of useful data, and he could probably write a better and more interesting paper for the next meeting than he could now.

The vote was then put on Mr. Wilbert's motion, and it was carried.

The Chair called on Mr. McGill, of Tennessee, for a paper on the legal requirements for the licensing of pharmacists as affecting the educational standard. Mr. McGill presented his subject as follows :

THE QUALIFICATIONS FOR LICENSURE REQUIRED BY LAW DETERMINE  
THE STANDARD OF PHARMACEUTICAL EDUCATION AND  
AMENDMENT OF PHARMACY LAWS.

BY J. T. MCGILL.

Since mistakes in preparing and dispensing medicines may lead to serious consequences, may endanger health and life even, it is manifestly in the interest of public welfare that the capability of a person to do this work efficiently be tested before entrusting him with the responsibility of licensure. The best test is the experience in doing it to the satisfaction of a competent judge. Hence such experience has been made a requirement for licensure by the laws of all the states. It has usually been incorporated in the laws under the name of drug store experience, for not until recent years has such experience been provided for in laboratories of pharmaceutical schools.

The drug store affords not only experience in preparing and dispensing medicines but also experience in trade or business. This latter kind of experience may eventually save the pharmacist from financial failure. But the failure of the druggist in business is not of sufficient importance to the public welfare to warrant an attempt to provide against it by law, hence the experience called for in pharmacy laws, at least a portion of it, should be obviously of the first-mentioned kind, and it should be recognized as such whether it is obtained in a drug store or in a well-equipped laboratory.

For surely the manufacture of a variety of preparations and the filling of numerous prescriptions selected from extensive files running through years, all done under the supervision of an instructor in a pharmacy school is of as much educational value as like work confined to the routine patronage of a drug store for a shorter time and under the supervision of a busy proprietor. Nor are the variety and intelligent selection secured by attaching the drug store to a school of pharmacy to say nothing of the difficulty of getting sufficient patronage for one store to furnish the required amount of experience for all the members of a class.

That the prescription has just been handed in by a customer and that it is filled in a building called a drug store do not enhance the value of the experience gotten in filling it. Yet in a large number of states no experience for licensure is allowed except that acquired in a drug store.

Let us see now how this affects the standard of pharmaceutical education. It discriminates in favor of short terms in schools of pharmacy. The less time spent in the school, the more time there is to be counted as experi-

ence and the sooner the candidate can come into all the rights and privileges of his chosen profession. To illustrate: Two young men working in the same drugstore go off to different schools of pharmacy, the one to a school requiring twelve months for graduation, the other to a school requiring eighteen months. The former can get license to practice six months before the latter, because he has six months more time out of school to get experience. If the twelve-months school has a drugstore in connection with it, then the time spent at school can be counted in the experience probation and the eighteen-months-school student will have to continue his work in the drugstore eighteen months longer than his companion before he can stand on an equality with him before the law. Considering the value put upon the licensure by young men, it is not surprising that the most of them choose to attend the schools thus favored by the law. And it is clear that these conditions tend to establish short-term schools, especially those with drugstore attachment, and make their requirements the standard of pharmaceutical education in the estimation of the public.

One of the conditions of membership in the American Conference of Pharmaceutical Faculties is that the school requires one year's work in a high school for the admission of students. The preliminary education required by law for licensure is in six states one year in a high school or more, in seven states a grammar-school education, in six states an indefinite amount, and in the remaining states none. The greater the number of states that make the preliminary educational qualification as much as one year in a high school for licensure, the easier it is for the American Conference of Pharmaceutical Faculties to establish it as a standard. It is difficult for a school or for a number of schools to maintain a higher preliminary educational qualification for entrance than is required for licensure in the same state where it is located or in neighboring states, for the licensure requirement sets the standard and puts any school at a disadvantage that attempts to go beyond it. If the Board of Pharmacy acting under the law says a grammar school education is sufficient, a young man who is preparing himself for the practice of pharmacy is not apt to seek a higher education than that, especially as every year thus spent beyond what is required will delay him just that much in entering upon his profession, for the time could be spent in a drug store and counted as experience. In order to meet the requirements of the law and enter upon the practice of his profession as soon as possible, it is to his interest to not get any more education than is required for licensure and then go to the school of pharmacy that has the shortest sessions. Such schools become the popular ones and may prove a good financial investment to those who establish them. Under such conditions it is not surprising that a few doctors and druggists can organize a corporation, and in three or four years build up a school of 140 or 150 pupils, while schools advocating and maintaining a better education for the honor of the profession of pharmacy have scant

and perhaps diminishing patronage. Perhaps the auspicious outlook for pharmacy schools as an investment may partially account for the difference observable in the following statistics for medical, dental and pharmaceutical schools :

Number of medical schools in 1901, 51 ; in 1905, 48 ; a decrease of 3.

Number of dental schools in 1901, 54 ; in 1905, 54 ; no change.

Number of pharmacy schools in 1901, 53 ; in 1905, 67 ; an increase of 14.

Number of pharmacy schools in 1905, 64 ; in 1907, 74 ; an increase of 7.

I have no statistics for medical and dental schools for the year 1907.

#### AMENDMENT OF PHARMACY LAWS.

The pharmacy laws relating to licensure as they stand to-day in most of the states are unfavorable to progress in pharmaceutical education, and to amend them, therefore, is a matter of the greatest importance. But how is this amendment to be accomplished? Go to a member of the legislature and try to convince him of the desirability of amending the clause relating to education in the pharmacy law, and he will ask whether the members of the State Pharmaceutical Association and the State Board of Pharmacy recommend it. Bring the proposition before the State Pharmaceutical Association, and it is referred to the Committee on Legislation. This committee puts it in the waiting list until other matters of alleged more immediate importance are disposed of. Take it to the Board of Pharmacy and you are told that nothing in that direction can possibly be done ; that the average legislator has no appreciation of the need of education for the druggist ; that such a change must be very gradual ; that it took the physicians twenty-five years to get such legislation. Having thus demonstrated the futility of endeavor, no effort is made.

These arguments for inactivity are not convincing. Why should the people not approve of a better education for those who are responsible for the medicines dispensed to them? Why should they be opposed to laws that will safeguard their health? If legislators attach little importance to the matter of education for the pharmacist, it is because the pharmacist himself does not insist upon it. It is for the members themselves of a profession to uphold it. If the importance of a high school education for the efficient practice of pharmacy had been advocated with as much zeal as the importance of four years of experience in a drug store, the former would be laid down as a requisite in the laws of as many states as the latter. The influence of pharmacists can secure the introduction of an educational proviso in state laws. Nor would the time required to accomplish it be so long as it was for a similar provision for medicine. It should be remembered that the advocates for higher education in medicine were pioneers in the work, and especially that against them were arrayed many of their own profession, owners of stock in medical corpora-

tions, the value of which was depreciated by any advance in educational requirements. Furthermore, it may be added that the advance has not been uniform, but greatly accelerated in the last few years; and we may point to education in dentistry to show that a change for the better may now be made quickly.

The State Pharmaceutical Association through its Committee on Legislation and the State Board of Pharmacy can exercise the most influence in amending pharmacy laws. If an educational qualification has not been introduced into the pharmacy law of a state, it is because these bodies have not been making strenuous efforts to have it introduced. They have not done so because they have not been strongly in favor of it. Now since the personnel of the Committee on Legislation and of the State Board depends upon that of the State Pharmaceutical Association, it follows that the members that advocate better education are in the minority in the State Association. This brings us to the conclusion that an important step towards getting an educational clause inserted in the laws of any state now without it is to get into the State Association a larger attendance of graduates of schools that favor higher educational qualifications. In some states the lack of attendance of such graduates may be due to indifference. In this case, it is the duty of faculties of schools to impress upon their graduates the importance of taking an active part in State Associations, since they may exercise so great an influence in favor of the enactment of good laws and in raising the educational status of their profession. But generally the cause of the small attendance is that there are not many such graduates in the states. As this is due to the small attendance upon schools of high grade and that in turn to the bad laws, the reason why the laws are not amended seems to be that bad laws favor poor schools, which graduate poorly educated pharmacists that make up the majority of the State Pharmaceutical Association, that appoints men on the Legislative Committee and recommends men for the State Board, who do not appreciate the importance of amending the bad laws that favor the poor schools, etc. The improvement of any of the agencies in this circle will tend to the betterment of all the others.

We have here in this gathering, many representatives of two of the most important of these agencies, the Boards of Pharmacy and the faculties of the schools, so that the combined influence of these would be a powerful factor in bringing about the desired results. But the Boards of Pharmacy, as they are charged with enforcing the laws, have greater influence than the schools in procuring the enactment or amendment of laws. The schools need the assistance of the Boards of Pharmacy. Some boards as at present constituted will not assist them because they either are satisfied with present conditions or are resting under the impression that the time has not come for improving them, and that efforts to that end would be fruitless. But surely a majority of the boards are in favor of such laws as will promote

better education in pharmacy, and in consequence make the profession of pharmacy a more desirable one, attracting to it a more capable class of men. The importance to pharmaceutical education of exacting a preliminary general education for licensures by Boards of Pharmacy, does not seem to have been fully appreciated. The fact is generally overlooked that *the standard of general education for licensure practically fixes the standard that can be successfully enforced for admission to schools of pharmacy*. For any school or association of schools that sets a higher standard than this is put at a disadvantage. The adoption of a prescribed preliminary education for licensure by all or by many of the states would enable the Conference of Pharmaceutical Faculties more readily to carry on its plan for a better general education for pharmacists.

Since the National Association of Boards of Pharmacy exercises more influence in the general adoption of pharmacy laws than any other organization, it is evident that the success of any measure looking to this end depends largely on endorsement by this body. Indeed the work of the Conference of Faculties and that of the National Boards of Pharmacy is so closely allied—both having the same great object in view—the promotion of pharmacy in education, in practice and in status as a profession—that coöperation is essential in carrying out almost any reform instituted by either body, and it is most fortunate that provision has been made whereby these bodies are enabled to meet here in the Section on Education and Legislation of the American Pharmaceutical Convention for discussion of questions of mutual interest.

The Chair called for discussion on the paper just read, but no remarks were offered.

The Chair then called for the reading of the report of the Committee on National and State Legislation, by the Chairman, Mr. Oldberg. Mr. Oldberg said he would like to preface his extemporaneous oral abstract of the report of the committee with an explanation. He said this report, would probably surprise the members, as being quite unlike previous reports of the same committee. Heretofore the committee has written a perfunctory report, which was simply a record of statistics of the laws passed in the various States, and of attempts to pass laws in the various States. Sometimes these efforts have been reported by the Committee on National and State Legislation, and sometimes by the Secretary of the Section on Education. The first thing the committee considered this year was the question as to whether it would be wise to duplicate work—whether it would not be better to ask the officers of the Section on Education and Legislation to take care of that matter, and this was done. He believed the report of the Secretary of the Section had been made, and the Committee on National and State Legislation had done nothing in the way of collecting statistics. The committee, he said, felt like recommending that the Committee on National and State Legislation be abolished.

The Association now has three committees that attend to the matter of legislation, viz: The Committee on National and State Legislation, Committee on Education and Legislation, and the Committee on the Status of Pharmacists in the Government Service, all performing similar duties; so the Association seems to have a super-abundance of machinery in that line.

Mr. Oldberg then proceeded to give a verbal abstract of the Committee's report, the full text of the report being as follows:

#### REPORT OF THE COMMITTEE ON NATIONAL AND STATE LEGISLATION.

*To the American Pharmaceutical Association:*

Your Committee on National and State Legislation submits for your consideration the following report:

You well know the lively interest manifested in all public health matters during the past few years.

Recent national and state legislation to regulate the manufacture and sale of food and drugs, to establish standards of purity and strength for medicines, and to correct the evils arising from the sale of habit-producing drugs, foreshadows a crisis in American pharmacy. You know the vigorous warfare now being waged by the Press and by the American Medical Association against the "nostrum" traffic which for fifty years has inflicted such serious injury upon medicine and pharmacy as well as upon the public. This warfare promises a better future for pharmacy.

The public and our legislators are not well informed concerning the nature of medicines and the business of preparing and selling them. The dangerous character of that business has been universally recognized for centuries all over the civilized world; but the attempts made in our country to regulate it have in the past been so crude that the advent of the national food and drugs act may be said to be only the beginning of needed reform.

The special functions of the pharmacist constitute a most important phase of the general plan of protecting the public health from the dangers attending the abuse or ignorant use of medicines. Hence the practice of pharmacy by persons not specially trained for it has been forbidden by law in all civilized countries.

The medical profession, which naturally takes a deeper interest in public health matters than other men, recognizes the plain truth that the proper regulation of the practice of medicine and the practice of pharmacy is impossible without definite and sufficient educational standards for those engaged therein. The earnestness and success with which the American Medical Association is seeking to improve medical education, and the fact that our medical men are further preparing to inquire into the status of pharmaceutical education in the United States, are signs of the times which we pharmacists should heed.

The pharmacy laws can have no other object or justification but that of protection to the public. But all our pharmacy laws are defective, many of them fail to provide the protection they were intended to afford, and some of them are such as to bring contempt upon the pharmacists and their occupation. To illustrate the farcical manner in which the grave responsibilities and hazardous character of the practice of pharmacy have been treated in American pharmacy laws and how they bring us into contempt, we call your attention to the fact that eight of these state laws confer upon minors (13 years of age) the right to open and conduct drug stores in their own name and upon their own responsibility, to practice and superintend the compounding of physicians' prescriptions, and to sell opium, morphine, cocaine, strychnine and other poisons without any control.



Sane men must know that as soon as the medical profession and the public press shall have discovered these and the many other glaring defects in our pharmacy laws, as they must sooner or later do, there is great danger of radical and ill-considered legislation to correct them. Neither the members of the medical profession nor the daily press can be prepared to undertake intelligently and safely the work of reform in this direction, for only experienced pharmacists who possess an intimate knowledge of the details of their occupation and who have given this subject serious and thorough study can be safely trusted to construct wise, just and effective pharmacy laws.

Therefore, to properly amend existing laws, or frame measures which shall be just to all concerned, and to prevent ignorant legislation which might be even worse than the laws we have, the pharmacists themselves must study this whole question and solve it in an intelligent, broad-minded manner.

We recommend that the American Pharmaceutical Association address itself to this important task in vigorous and thorough fashion.

While this Association has already considered some of the phases of this subject at its annual meetings every one knows that academic discussion and resolutions adopted after a few hours' talk, without previous consideration and without a subsequent thought, accomplish nothing. Persistent, energetic, unselfish work is the only road to success, and the first step should be a vigorous campaign of education extending through every state and territory.

The importance of this question to the very life of our profession must be brought home to its individual members and to all the State Boards of Pharmacy and State Pharmaceutical Associations before any effective reconstructive work can be systematically planned and carried on.

We believe that every druggist in the United States ought to be informed concerning the reasons for pharmacy legislation and the vital way in which it affects his standing and material welfare. The cost of placing in the hands of the druggists a comprehensive statement of these matters would not be great and the expenditure of whatever amount may be required would be the best investment the Association can make for the benefit of American Pharmacy.

Your Committee proposes to attempt in this report a reasonably complete presentation of the relations of pharmacists, the public, and the medical profession to each other, and their respective rights and duties so far as these are necessarily affected by pharmaceutical legislation.

#### LEGAL REGULATION OF THE PRACTICE OF PHARMACY IS UNIVERSAL.

The practice of pharmacy is regulated by law in every civilized country. In most countries this regulation, begun many generations ago, has become very systematic and effective. In the United States it is still in an experimental stage. In many respects our pharmacy laws are grotesquely inconsistent. But we are getting our bearings. It is now not only possible but imperatively necessary that we should make substantial and permanent changes.

#### THE REASON FOR PHARMACY LAWS.

The public is as unable, except by legal regulation, to protect itself against the grave danger to health and life which attends the abuse of medicines and poisons, and their sale, as it is to protect itself in any other way against incompetent locomotive and steamboat engineers, unsafe public buildings, and unsanitary plumbing. That is the sole reason for the pharmacy laws.

#### METHODS BY WHICH PROTECTION IS SECURED TO THE PUBLIC.

Protection against ignorant and irresponsible vending of drugs and poisons is sought to be effected by laws creating a distinct kind of public servants, called pharmacists,

who shall possess the special training and experience necessary to make them intelligent and safe dispensers of medicines, and prohibiting all other persons from dispensing or selling medicines to the public. These laws, to be of any value, must prescribe definite minimum educational qualifications for the practice of pharmacy. This the pharmacy laws of the United States fail in nearly every instance to do. Even the best of our pharmacy laws are indefinite, indirect or very incomplete in that particular.

#### PHARMACY LAWS INCIDENTALLY PROTECT THE PHARMACIST AS WELL AS THE PUBLIC.

Pharmacy laws are not enacted for the purpose of restricting competition in the drug business or in any manner to benefit the pharmacist above other men. Class legislation is not permitted. But civilization demands the restriction of individual freedom to the extent necessary to the protection of the rights of all. The pharmacy laws give to every individual the right to practice pharmacy upon the same condition, that he shall be so trained as to be competent to do so without injury to others.

While intended solely for the protection of the public, they incidentally protect also the competent pharmacist, not from competition by other competent pharmacists who comply with the law, but from competition by incompetent men, who, but for these laws, would engage in a pursuit which incompetent men can not practice without danger of serious injury to their fellow men.

The prerogatives which the licensed pharmacist enjoys apply only to his technical duties as a pharmacist and in no degree to his business as a dealer in merchandise. If his business consists exclusively of the compounding or dispensing of medicines, then the whole of it is protected by the law as described; if one-half of his business is of that kind, then that half of it is protected; if only one-tenth of it is pharmacy then nine-tenths of it is business such as any person may engage in without being a pharmacist.

The pharmacist is necessarily a merchant because he sells the medicines he dispenses. But he differs from all other merchants. His chief function is the technical-professional service he renders to the community and to each individual whom he serves. He is justly entitled to proper compensation for his services as the trained specialist he is required by the law to be.

The public is to a great extent responsible for the numerous "side lines" of the business done by druggists, because customers expect to find all sorts of miscellaneous merchandise in the drug stores; but the commercial druggist has encouraged this demand. In many localities the druggists are obliged to combine the usual mercantile traffic with their pharmaceutical business in order to make a living.

Purely commercial traffic pays if conducted in a business-like way; but it requires considerable capital, a large volume of trade is necessary to make it profitable, the expenses are great and the margin of profit small. Close competition is, therefore, inevitable. The attention which such business demands is absorbing.

Pharmaceutical work, on the other hand, demands far less capital because it does not require a large stock of merchandise and a large volume of trade, and does not call for great expenses for rent and salesmen. The pharmacist sells skilled labor and professional services rather than merchandise.

All miscellaneous merchandising done in drugstores is subject to unlimited competition by other stores. The pharmaceutical work is necessarily reserved for pharmacists.

It seems to your Committee, therefore, that diligent effort should be made to preserve, improve and extend the really pharmaceutical part of the druggist's business.

#### THE AMERICAN PHARMACEUTICAL ASSOCIATION

is the natural conservator of the scientific-professional character and functions of pharmacy and the aspirations of pharmacists. For more than a half century it has stood for the highest aims of our craft and labored for its true welfare. The foremost men in our

profession engaged in the practice of pharmacy, and our educators, writers and specialists have sought membership in our Association, and received a hearty welcome. The Pharmacopœia of the United States has been in a large measure the product of members of this Association, and the National Formulary is also the work of our members. The Constitution of the American Pharmaceutical Association defines its objects to be:

To advance the art of pharmacy by stimulating investigation and improvement, and diffusing scientific-technical knowledge pertaining to it; foster sound pharmaceutical education; demonstrate the importance and the value of the services of properly trained pharmacists to civilization, and the necessity of restricting the dispensing of medicines to their hands; uphold the dignity of the pharmacist's calling, and extend the field of his usefulness to the community; enforce due observance of established standards defining the identity, purity, quality and strength of medicines; aid in the suppression of empiricism, the regulation of the sale of dangerous and habit-producing drugs, and the protection of the public health; maintain respect for right ethical standards in the practice of pharmacy; promote relations of comity and mutual respect between physicians and pharmacists, and in all proper ways promote the true welfare of pharmacy and pharmacists.

Every American pharmacist owes it to himself, his occupation and his fellow-workers, to be a member of this Association.

#### THE LICENSE TO PRACTICE PHARMACY IS NOT MERELY A PERMIT. IT IS A CONTRACT.

A candidate applying for registration and license to practice pharmacy must prove that he possesses the qualifications prescribed by the law before he receives the permit sought. But this does not end his legal obligations as a pharmacist. It is, on the contrary, but a preliminary to the service he is bound by his contract to perform to the community as long as he continues to exercise his right to practice. It is not enough that he shall possess the knowledge and efficiency without which he cannot be regarded as a safe dispenser of medicines; he must faithfully apply that knowledge and efficiency in the actual practice of his occupation in order that the public may receive the benefits to which it is entitled in return for the privileges conferred upon him.

#### MANUFACTURERS OF MEDICINES AND WHOLESALE DRUGGISTS ARE EXEMPT

from the operations of the pharmacy laws on the ground that they sell medicines only to registered and licensed pharmacists who do not require the protection which the pharmacy laws are designed to afford to persons who are rightly assumed not to be able to protect themselves. But manufacturers and wholesale druggists who are not registered and licensed pharmacists can not legally sell or dispense medicines direct to the consumers or their representatives.

#### PATENT MEDICINES EXEMPT FROM THE OPERATION OF THE PHARMACY LAWS.

The nostrums commonly called "patent medicines" are expressly made exempt from the operation of the pharmacy laws, so far as these laws relate to the registration and license of pharmacists, because it requires no special technical training to sell any merchandise in unbroken original packages.

Your Committee recognizes fully the glaring inconsistency displayed in legislation which permits the unrestricted traffic in secret, semi-secret, dangerous, and even fraudulent, cures, recommended to the public through the usual advertising media by self-evident and gross misrepresentation, while the dispensing and sale of necessary medicines ordered by licensed physicians are regulated. Our laws afford no protection against the wholesale abuse called the patent medicine business. The nostrum makers are allowed to treat disease without diagnosis, without a license, and without that special education which is demanded of the licensed physician who sees his patient and who

undertakes the treatment after due diagnosis and continues it with the patient under observation.

But the failure to forbid such an enormous evil as the nostrum traffic is a question apart from that of establishing reasonable and sufficient standards of efficiency for the practice of pharmacy. Quack nostrums are an evil no matter by whom they are sold.

#### MEDICINES WHICH ARE NOT EXEMPT.

All medicines dispensed, given, or sold directly to the consumers or their representatives, or to the public, whenever so dispensed, given or sold, except the so-called "patent medicines," should be included in the restrictions imposed by the pharmacy laws, whether dispensed, given or sold in drug stores, or in hospital dispensaries, or in any other place.

Drugs and poisons are just as dangerous when given away as when they are sold.

All medicines not exempt from the operation of the pharmacy laws must be dispensed or sold only by legally registered and licensed pharmacists.

#### PHARMACY IS AN INDISPENSABLE SPECIAL BRANCH OF MEDICINE.

Although medicine and pharmacy are distinct professions, it is as clearly true that pharmacy is a special branch of medicine as that physiology, hygiene, bacteriology and pharmaco-dynamics are, each and all, special branches of medical science. Pharmacy is of great importance to all medical practitioners because every branch of medical practice must depend upon pharmacy for reliable medicines.

The duties of pharmacy comprehend the determination of the identity, quality, purity and strength of the materials employed in the preparation of medicines, as well as the art of converting these materials into suitable forms for immediate use. The proper performance of these duties demands an adequate knowledge of the structure, composition and properties of drugs and other pharmaceutical substances, a thorough acquaintance with the scientific principles governing chemical and pharmaceutical processes, and sufficient practical experience.

An extremely important part of the duties of the pharmacist is the control of the quality and reliability of the medicines he dispenses. It is his duty to see to it that they are genuine, pure, of the required strength, fresh, in good condition, and in every way right. He should attend to this duty not only in procuring his supplies, but continuously. In other words, he must procure his supplies from reputable sources, preserve them in an effective manner, renew them frequently enough to insure that they are fresh and reliable, examine them from time to time, and reject any article found to be no longer in perfect order. He must himself make the many preparations, whose nature is such that they should always be prepared *ex tempore*. These are things that must be attended to in order that the sick may be properly served, and no one but the well-trained, experienced and faithful pharmacist, equipped with the necessary facilities, can attend to them.

In the present campaign against drugs and preparations which do not conform to recognized standards, or to the representations made concerning them, it has been clearly proven that medicinal supplies cannot be accepted on trust.

The pharmacist's services are necessary. The better his special education is, the more effective will his services be. He who cannot render any valuable service in this direction is not a pharmacist. Almost any experienced druggist can do a great deal more than almost any physician in the matter of supplying proper medicines, but more and better work is now required of the pharmacist than ever before, and he must be prepared for it.

Wholesale druggists and manufacturers no less than the retail druggists will welcome the day when unfit medicinal supplies no longer find a ready market. Only the dishonest will object.

## UNFIT DRUG STORES.

Not every place called a drug store, or having red, blue or green show globes in the windows, is a properly equipped and safely conducted pharmacy.

The pharmacy laws do not accomplish their object unless the pharmacist is able to perform his duties in a proper way. Unfit, ill-kept drug stores, lacking the most important medicines and the equipment and facilities necessary to safe and accurate dispensing, are a menace to the public health. They are a greater evil than unsafe banks, for health, life and good morals are worth more than money.

Superfluous drug stores are accordingly to be avoided on the sufficient ground that the degree of efficiency demanded for the protection of health and life is incompatible with a competition so excessive as to breed places in which legitimate business is so limited that the owner, unable to make a living honestly, can not resist the temptation to make it dishonestly.

Absolute integrity and faithfulness are vitally necessary in pharmacy.

In many of the countries of the old world the increase of drug stores beyond the number actually needed is effectively prevented by law.

Your Committee will not undertake to say how many efficient and wholesome pharmacies can be supported by any given number of thousands of inhabitants; but in our country we have several times as many drug stores in proportion to population as in any country on the continent of Europe, and it is everywhere evident that if the drug stores in the United States were reduced to one-half their present number the public would be far better served. Who does not know that drug stores exist which are of such a character as to constitute nuisances injurious to the moral as well as the physical health of the community?

The public welfare demands the extinction, if possible, of the disreputable resorts which bring reproach upon reputable druggists by calling themselves drug stores, while in reality they are tippling shops or places where habit-producing narcotics are peddled to the unfortunates who are either being taught the drug habit or are already slaves to it.

The pharmacy laws should require that druggists who sell liquor, except for medicinal purposes, and those who sell narcotics to drug slaves shall have their licenses revoked.

## MEDICINE AND PHARMACY DIVORCED CENTURIES AGO SHOULD NOT BE RE-UNITED.

The complete separation of the practice of pharmacy from the practice of medicine was effected in nearly all civilized countries long ago. Medical science and the art of pharmacy were both enormously benefited by that separation.

Centuries ago all physicians were their own pharmacists. Later they employed helpers to prepare their medicines. Those helpers, as must naturally be expected, gradually acquired a more extended and accurate knowledge of drugs and greater technical skill in preparing them for use than their teachers and masters had possessed. At the same time the physicians, released from the time-consuming pharmaceutical work, were able to make more rapid progress in mastering anatomy, physiology, pathology and therapeutics.

In our new country the separation of pharmacy from the practice of medicine has not yet been carried out to the same extent as in older countries. On the contrary, the tendency was for a time in the opposite direction. But the temporary reaction only served to emphasize the need of continued efforts to make the separation complete. Any attempt to re-unite medical and pharmaceutical practice must be futile.

Physicians must be permitted to dispense medicines in communities where no pharmacist is within reach, and pharmacists may, in emergencies, give such advice and relief as they are able to render, when necessary, in the absence of accessible medical attendance; but in communities where the services of both physician and pharmacist are available only properly trained physicians should be permitted to diagnose and treat disease and only properly trained pharmacists should be permitted to prepare or dispense medicines

for the sick. Deviations from that rule are contrary to wise public policy, for they must necessarily result in lowering the ethical standards of both physician and pharmacist, and a combination of the two occupations in one person would remove a valuable check upon possible errors in both prescribing and dispensing and tend to render impossible the detection of not only gross ignorance and negligence but of deliberate criminal malpractice.

A physician who makes it a practice to dispense drugs at his office is not unlike a druggist who practices medicine, and a druggist who prescribes for his customers is a "doctor" who runs a drug store.

#### PHYSICIANS AND PHARMACISTS SHOULD TRUST AND RESPECT EACH OTHER.

No man can justly hold either the whole body of physicians or the whole body of pharmacists responsible for the existence of the doctor-druggist or druggist-doctor. Physicians and pharmacists alike, when they thoroughly understand the unwholesome tendencies of combining medicine and pharmacy into one occupation, are sure to disapprove of the combination. Indeed, it is quite probable that the doctor-druggist himself, could his eyes be fully opened, would dissolve the partnership unless circumstances render it unavoidable.

Many druggists are ignorant, incompetent and dishonest men. Quite as many men in the practice of medicine are equally ignorant, incompetent and dishonest. But there are educated, competent and honest men in both occupations, too. The utterance of counterfeit money should admonish us to look at all money more closely; but we do not refuse all money because some of it is bad.

Let the competent physicians and pharmacists get together and stand together on the platform of an honest square deal to everybody.

#### THE OWNERSHIP OF PRESCRIPTIONS.

One fruitful cause of friction between physicians and pharmacists has been the mooted question of the ownership of prescriptions, and the too general practice of druggists to refill prescriptions whenever called upon to do so.

The learned (?) and lengthy legal arguments advanced anent the question, who owns the prescription, seem to your Committee to be for the most part unworthy of the slightest respect. It has been argued that the prescription is a piece of merchandise sold by the physician to the patient for a consideration, and that this bargain and sale covers not only the possession of the piece of paper and what is written upon it, but also the right of the buyer to make use of the prescription in any way he may see fit. Such a view of the matter is preposterous and untenable on legal grounds.

Whenever the prescription calls for any article which can be legally sold only upon a physician's prescription the druggist who fills it must necessarily retain the prescription as his authority for the sale.

Whenever a physician charges a professional fee it is not for one or more prescriptions, but for diagnosis, advice and treatment.

The physician often writes more than one prescription at the same time, but that makes no difference in his fees for professional services.

For the prescription or prescriptions he may write he never makes any charge whatever, and consequently there is no bargain and sale.

Only a quack would ever pretend to sell a prescription of any kind or at any price.

The prescription is simply a written memorandum which is necessary to enable the patient to procure without difficulty the medicines needed.

The physician frequently gives his order or prescription over the telephone to the druggist.

When the medicine has been administered the physician observes the effects. He

continues the same medicine or changes it. Each remedy prescribed has its own particular object. No prescription can be said to be a cure or complete treatment for the disease from which the patient suffers.

The patient is often ignorant of the cause of his trouble, and he is not competent to diagnose disease either in himself or in others. He cannot know why the medicine was ordered, what its effects are, or when it may be proper to use it, and for what purpose. How absurd, then, to hold that the patient owns the prescription and may properly have it refilled without the prescriber's express order, or may give it, or a copy of it, to any person, to be filled for any purpose whatsoever!

Clearly the prescription belongs to its writer rather than to the patient until delivered to the pharmacist, and when filled it belongs to the pharmacist with the understanding that it is at all times to be accessible to its writer, and not to be abused by being refilled without the prescriber's consent or order. Neither the patient for whom a prescription is written, nor the pharmacist who fills it, has any right to take the intolerable liberty of using it for any purpose except that for which it was written, and that purpose was fulfilled the first time the prescription was dispensed.

Only licensed physicians are allowed to practice medicine, and special laws have been enacted to forbid others from performing any of the duties permissible only to licensed physicians. But if a layman can buy prescriptions from licensed physicians and recommend the medicines they call for to other persons, then he is practicing medicine without a license, and any druggist who fills those prescriptions is aiding and abetting his illegal acts.

#### HOW PHARMACISTS WERE DEPRIVED OF THEIR OCCUPATION.

We all know that during the past fifty years the pharmacist has gradually lost a great part of the work which formerly constituted his chief occupation. Two generations ago he made many of the preparations he dispensed; the so-called "patent medicines" he was obliged to sell to satisfy the demand of his customers were not so numerous nor so flagrantly fraudulent as now, and the drug stores then did not sell soda water and ice cream and the numerous other things they now supply which are utterly foreign to pharmacy. But the stupendous growth of the quack nostrum traffic came near strangling legitimate pharmacy, and the exposure of its fraudulent character placed the druggist who recommends patent medicines in an unenviable position in the eyes of thinking men and besmirched the whole drug trade, the innocent with the guilty.

Then came the maker of fake proprietary preparations who succeeded in deceiving a large number of physicians and in inducing them to prescribe their products. The extent to which some physicians permitted those manufacturers of ready-made prescriptions to dictate the treatment of patients made serious inroads upon the legitimate practice of pharmacy. Many physicians dispense medicines from their offices, thus usurping the functions of the pharmacist and eliminating him from his rightful occupation. In some states this practice is in direct violation of law. It is everywhere not only unfair to the pharmacist, but a practice which, if permitted to continue, will be imitated by those engaged in criminal malpractice to render detection difficult if not impossible.

These are wrongs from which the public, the medical profession and the pharmacist have all suffered grave injury.

#### THE REACTION HAS SET IN.

Such a state of affairs could not continue indefinitely. Active and earnest agitation is being carried on by unselfish, highminded, able men all over the country to check these evils. This reform movement will succeed because it is right. The battle will not be won in a year, or in five years; but it has already begun to bear fruit, and persistent work will bring increasingly substantial results.

Those enlisted in this righteous war are physicians and pharmacists of the best type. They will not be discouraged by the fact that some physicians and druggists will refuse or fail to render any aid, that others will oppose the movement, and that many who engage actively in its support will do so from purely selfish motives and thus actually do it harm.

#### THE PROPAGANDA IN FAVOR OF THE REMEDIES OF THE U. S. P. AND THE N. F.

A pamphlet of 100 pages, entitled "The Propaganda for Reform in Proprietary Medicines," published by the Council on Pharmacy and Chemistry of the American Medical Association, exposes a large number of brazen frauds perpetrated by manufacturers and venders of nostrums advertised in medical journals. We quote from the pamphlet the following:

"The physician is not supposed to be a chemist or a pharmacist, and if he were, he has neither time nor inclination to examine all the products he is asked to prescribe, or to inquire into the standing of those who exploit them. The number has become so great that to attempt to separate the good from the bad is bewildering, and no one individual is courageous enough even to try. The result of it all is that the educated, thinking physician—who is honest with himself and with his patient—refuses to prescribe any proprietary mixtures; he classifies them all as secret nostrums and lets it go at that."

Educated physicians, without being chemists or pharmacists, know that the exploiters of medicinal preparations whose composition is to any degree secret are not likely to possess any really valuable knowledge which is not accessible to others or skill which others may not attain. It is evident from the results of the examination made of these nostrums that many of them are gross frauds, and that the numerous proprietary preparations, which are not fraudulent or secret, are combinations of well-known remedies. Ready-made combinations of remedies may be valuable in many cases, but to say that such combinations of drugs in fixed proportions fit any large share of the cases for which they are specifically recommended by their makers is to say that the services of the physician are to a great extent superfluous. "Machine prescribing" is quite incompatible with high ethical standards and professional attainment in medicine. Prescribers should know the virtue of each individual drug they use. They cannot attain that knowledge from the effects produced by mixtures.

Faithful physicians accordingly propose to select their remedies without reference to representations of selfishly interested parties, prescribe the remedies of the pharmacopœia and other recognized standard preparations of definite and known composition, in such doses and combinations as they may deem most fitting, according to the indications in each case under treatment, and depend upon the services of the pharmacist to prepare and dispense the remedies prescribed.

Whenever a physician specifies in the prescription a certain make of a preparation, he takes upon himself the responsibility for that preparation. Any reputable pharmacist will, of course, dispense precisely what is ordered, but he can not be held responsible for a product the composition and character of which are not fully known. Only the manufacturer knows what materials were used, the proportions employed, and the method of preparation. Manufacturers have their own formulas and processes, which are not known to the dispenser. The date when the preparation was made and the manner in which it may have been kept since that date can not be known.

The preparations ordered by prescribers to be those made by some specified "discoverer" or manufacturer are almost all of the class known as proprietary specialties—those for which special superior merits are claimed without any tangible evidence in support of that claim. Such preparations are, wholly or partially, secret nostrums subject to no verification or control, and when dispensed, may be right or wrong, old or new. They usually pass through several hands before they reach the dispensing pharmacist who must accept them unless they bear unmistakable external evidence of being in bad order.



Pharmacists freely admit that there are many medicinal products which can be more successfully made in manufacturing laboratories having facilities which the dispensing pharmacist cannot have; but the claim so often put forth by manufacturers that only a few medicinal preparations can be as well made with the facilities generally found in reputable retail pharmacies is as grossly exaggerated and ridiculous as the claim of the maker of any proprietary preparation that he possesses some valuable secret by which he alone is enabled to produce the remedy in proper condition.

Medicines are most reliable when fresh. The most active and important generally deteriorate more rapidly than others. Any preparation, therefore, that can be made by any competent pharmacist should clearly be made by the dispenser in order that he may be able to dispense a fresh product. Then only can he with justice be held responsible for it. Any medicinal preparation about which the maker fails to tell the whole truth should not only be suspected; it should never be used.

In view of the widespread acclaim with which the movement generally referred to as the "propaganda in favor of U. S. P. and N. F. preparations" has been received, it is of vital importance that it shall not be misdirected or misunderstood. Properly interpreted it means the application of correct ethical principals to the prescribing and dispensing of medicines, and proper mutual relations between physicians and pharmacists. So far as it concerns the physician it means that he will permit neither self-interest, nor the love of ease, nor the plausible tongue of the "detail man" of the manufacturer of medicines, to lure him away a hair's breadth from the path of duty to himself, his profession, and his patients. To the pharmacist it means that he must do all in his power to render effective service, and respect to the fullest extent the rights of the physician and the sick.

Will the pharmacist meet the new demands upon him in the right spirit? Will he do his full duty because he sees it to be right, or will he support the reform movement solely in consideration of assurances of an increased prescription business?

All right-minded pharmacists condemn quackery, counter-prescribing and the reckless "re-filling" of physicians' prescriptions.

But pharmacists have the right to expect equally honorable treatment from the medical profession. They have the right to expect that physicians shall not deprive the pharmacist of his legitimate and honorable occupation and his means of livelihood. Physicians cannot keep such a complete stock of medicines in their offices that they do not find it necessary to write occasional prescriptions. Pharmacists who can and do keep a complete supply, who are able to judge of the quality of drugs and medicines, who renew their stock frequently enough to have all remedies fresh and reliable, and who have all the necessary facilities for accurate dispensing, cannot live on the meager profits of such occasional prescriptions. Honorable physicians will readily recognize that fact. Yet, so prevalent has the practice become for physicians to furnish medicines as well as advice that pharmacists have been driven to the necessity of engaging in general merchandizing to eke out an existence. This should not be.

#### HOW THE MATERIAL PROSPERITY OF THE PHARMACIST CAN BE PROMOTED.

Thousands of druggists apparently fail to recognize the fact that they can wield a tremendous power to insure their material prosperity as well as an honorable standing in the community by making the most of their distinctive functions.

The druggists have the reputation of being robbers who charge enormous prices and who would "get rich quick." They have only themselves to blame for that false charge, for they have publicly given far greater attention to purely commercial questions than to anything else. If they would instead demonstrate the importance of their technical services to their fellow men the question of their financial prosperity would be solved.

Our material prosperity depends first, last and all the time upon how well we perform

our peculiar duties as pharmacists. No part of our business is our own exclusive prerogative except our art.

Before we can make our profession respected we must first prove its respectability, our own faith in it and our devotion to it. Let every pharmacist take pride in giving his best attention to every little detail of his pharmaceutical work. If he himself treats it with indifference, how can the public do otherwise?

Many retail druggists declare that they do not care about the "scientific part of the drug business," because there is so little of it to do that it is not worth considering. The truth is that they have so little scientific-technical work to do because they do not care enough for it.

Many a druggist has built up a prosperous business by doing all his work in the most workman-like fashion to the least detail. Many another has ruined his chances by displaying ignorance, incompetence or slouchy indifference.

#### EXCESSIVE COMPETITION IN THE DRUG BUSINESS AND ITS CHIEF CAUSE.

From published statistics your Committee finds that the number of Registered Pharmacists licensed is in every state extraordinarily excessive in proportion to the population. and, in fact, in proportion even to the actual number of drug stores, while either no Registered Assistant Pharmacists are provided for or the number of these is ridiculously small.

This can not but have a most demoralizing tendency.

The Registered Pharmacists are armed with licenses to open or conduct drug stores. They may and do serve as clerks or assistants if they can not go into business on their own account; but they are almost irresistibly tempted to start in business for themselves at the first opportunity, and the great and constantly increasing excess of drug stores is mainly due to that fact.

And yet, having already at least twice as many drug stores as can be supported in a state of healthy efficiency, we keep on making so many more full-fledged Registered Pharmacists annually that the total number on the rolls in several states is more than twice the number of drug stores!

#### THE ONLY REMEDY.

There is a simple and effective remedy for this ruinous system. The continued excessive increase of superfluous drug stores of a low grade can be prevented to a great extent by adopting the reasonable and proper method pursued in all the older civilized countries of the world—that of requiring that all who may hereafter apply for license to open or conduct pharmacies on their own account must have a systematic special education received in a reputable school of pharmacy. That simple remedy would meet the hearty approval of both the public and the medical profession, and every person already holding the certificate of a Registered Pharmacist must be benefited by it for certificates already issued must, of course, remain in force and would become increasingly valuable.

It is as necessary to the public health that graduation in pharmacy shall be obligatory upon pharmacists as it is that graduation in medicine shall be so in the case of physicians.

The absurdly excessive number of Registered Pharmacists already licensed and the excessive additional number added every year prove conclusively that the standard of educational qualifications is too low and can be very materially raised without the least difficulty and with great benefit to the public and all others concerned.

While we have an over-supply of Registered Pharmacists the supply of Assistant Pharmacists is absurdly insufficient. Many of our states have none. Other states have from two to five times as many drug stores as Registered Assistants. A rational plan would be to have more clerks than stores.

The plausible doctrine preached *ad nauseam* that poor but worthy and ambitious

young men who cannot afford to go to college must have every opportunity to make their own way in the world does not apply here. They do have the opportunity to go to college, and those who have the grit do it. No person without a medical education is permitted to practice medicine, and no person without a pharmaceutical education should hereafter be licensed to run a drug store.

The freedom and opportunity which all must share to do what they will cannot be stretched to the extent of permitting any individual to endanger the common welfare.

#### SOME OF THE MISCHIEF DONE BY OUR PHARMACY LAWS AS THEY ARE.

The mere fact that we have laws regulating the practice of pharmacy lulls the thoughtless into a false sense of security which prevents inquiry into the character of those laws. Many people actually believe that all druggists must be educated pharmacists.

But the pharmacy laws are such that when read they must necessarily create in the mind of the reader a very poor opinion of the importance and dignity of pharmacy. To the thoughtful critic an analysis of these laws must make it plain that the only difficulty to overcome by any one seeking a license to practice pharmacy is that of successful cramming for the examination.

Some of the harm these laws have done and are doing may be readily seen:

They reflect discredit upon pharmacy by their failure to make mandatory respectable, definite qualifications for practice.

Some of these laws admit to license persons without any practical experience in drug stores.

Some of them authorize the licensing of minors.

Nearly all of them permit the admission of educationally unfit persons to "learn the business."

Instead of prescribing actual education for pharmacy the pharmacy laws are so worded that they positively discourage it, for illiterate boys can acquire the right to take the licensing examination without cost (earning their living in the drug stores during their apprenticeship) while those who graduate from the high school and the school of pharmacy and can not earn wages during the years devoted to their better education, expend their time, labor and money without any substantial recognition therefor.

Although it is universally recognized that the most important subjects which must be included in pharmaceutical education are materia medica, chemistry and the scientific general principles of pharmacy, and, as every one knows, the licensing examinations invariably cover those subjects chiefly if not exclusively, nearly all the laws utterly ignore the fact that they are not and never can be properly taught or studied in the drug store.

Under the practical operation of the pharmacy laws the number of drug stores is constantly being increased although already far beyond reasonable and wholesome limits.

The pharmacy laws, or the effects of their interpretation, create a scarcity of drug clerks.

The pharmacy laws proceed on false premises ignoring the actual conditions under which pharmacy is necessarily practiced and substituting imaginary conditions which are impossible.

Most of the pharmacy laws fail signally to take into account the decided difference between the responsible master pharmacist who conducts a drug store and his clerk who is always simply an agent subject to the orders and regulations enforced by the employer.

#### PHARMACY LAWS RECOGNIZING ONLY ONE CLASS OF PHARMACISTS.

All laws that cannot be enforced are bad. A pharmacy law that requires the assistant or clerk in the drug store to be the equal of his employer in training and experience is

practically a dead letter. But many of our state laws mention only registered pharmacists, thus requiring the clerk as well as the employer to be of that grade.

The inevitable result is that the minimum requirements for license, if high enough to insure to the people a class of thoroughly efficient master pharmacists who shall conduct the drug stores, must be too high to afford the necessary number of clerks or assistants, and if low enough to provide enough clerks, must be too low to insure that the responsible managers shall be of the right sort, and so low as to lead to an excessive number of drug stores, and thus to degrade the character of the latter.

#### NEW AND AMENDATORY LEGISLATION.

Let us amend the laws in such a way that we may heartily respect them. Let us appreciate fully the dignity of our State Boards of Pharmacy, and see to it that their proper functions are exercised and their authority sustained without political interference.

Let us adopt larger ideas of all our affairs. If increased expenditures are necessary to conduct the business incident to an efficient administration of the pharmacy laws, let us see to it that the funds are forthcoming. While we should not permit extravagance, neither should we be satisfied with cheap makeshifts which cannot but render the work of the boards of little or no value and bring the law into contempt.

Above all, reasonable and respectable standards of education for our occupation must be established if we would have the respect and confidence of intelligent men.

The betterment sought must conform to a well-considered plan, consistent in all its parts, practical, just, and capable of gradual development until as nearly satisfactory conditions as may be attainable shall have been established.

The changes which are necessary can not be effected all at once. Rights already conferred can not be disturbed. The new regulations can not be made retroactive. But we must be prepared to do our duty in promoting the introduction of the improved conditions which we see to be necessary to a wholesome future for our calling.

In states where existing conditions prevent immediate changes it is advisable to render new legislation effective one, two or three years after the date of its passage. This proviso applies especially to increased educational requirements. States not now ready to demand graduation in pharmacy as a condition prerequisite to license could easily adopt it to take effect at a fixed future time.

#### THREE GRADES OF WORKERS IN PHARMACIES.

Every one knows that three quite distinct grades of workers are absolutely necessary in pharmacies. This has always been the case and always will be, and no pharmacy law can possibly be efficient and just which does not take due cognizance of it.

The three grades are: 1, the responsible managers or master pharmacists; 2, the assistants or clerks; 3, the beginners or apprentices.

The owner or manager of a drug store may do so little business that he can get along without any help, or he may have a registered assistant and no apprentice, or he may have the help of a beginner only. Many druggists employing more than one assistant prefer experienced men and never take an apprentice. But the fact remains that clerks and apprentices are and always will be necessary, and that a graded system of advancement in the service is not only the most efficient and satisfactory but the only system which an effective pharmacy law can take into account.

Book-keepers, mercantile salesmen, porters, messengers and others who do not dispense or sell medicines or assist in any technical pharmaceutical work may be freely employed in drug stores without being registered or licensed under the pharmacy laws, since such persons are not required to possess any pharmaceutical knowledge or training. On the other hand, all persons who take part in the technical work of pharmacy, or assist in such work or dispense or sell medicines to the public must possess such qualifications as

are necessary to render their occupation safe from the stand-point of the public health, while their commercial qualifications, however important these may be to their employers, are, of course, wholly without the scope of the pharmacy laws.

The public is entitled to a system which shall insure efficient and responsible direction or management of the drug stores upon which it must depend for medicines.

It is entitled, further, to the services of safe and efficient dispensers in those stores, and to a rational method by which a continuous future supply of competent pharmacists may be provided for.

Hence the respective qualifications, duties, privileges and responsibilities of each of the three classes of pharmaceutical workers mentioned must be distinctly recognized and defined by the pharmacy laws, in order that their object may be attained.

Pharmacy laws which fail to give proper protection will certainly be repealed.

THE WIDE DIFFERENCES BETWEEN THE RESPONSIBLE MANAGER AND HIS CLERK SHOULD BE CLEARLY RECOGNIZED.

The only reason advanced in favor of but one grade of practicing pharmacists is that the clerk as well as his employer must prepare and dispense medicines, and must, therefore, be as well qualified. But while it is true that every dispenser must be competent, whether employer or employee, it is clearly a mistake to ignore the great difference between the manager and the clerk in other respects.

*Managers* of pharmacies are responsible not only for their own acts as such, but also, under the common law, for the acts of any persons in their employ. The manager is responsible for the whole establishment, and all its stock and appointments. He is the man who must exercise such *bona fide* supervision of the conduct and service of the pharmacy that the rights and welfare of the public are properly safeguarded. The employment of any other legally qualified person to prepare and dispense medicines in his store, or even to act in his place in his temporary absence under the rules and regulations he may impose, does not relieve the actual manager of his responsibility for the conduct of the place and for the medicines dispensed in it.

Every pharmacy must be in charge of a responsible manager, who must be a Registered Pharmacist, and whose license should be displayed in the store under his charge, and the manager of one pharmacy cannot at the same time legally be the manager of another without nullifying the intent of the law. If one individual owns more than one pharmacy each pharmacy must have its own responsible manager, whose license is displayed there.

To hold that any manager of a drug store ceases to be its real responsible manager whenever he absents himself from it for a few hours or a few days (or even a few weeks) would be absurd, for his direction and supervision of affairs still continues. He is required to give the conduct of the store due attention, to "run it" properly, and not to absent himself from it to the extent of neglecting his duties to the public. Any other view of the matter is unreasonable, and, therefore, untenable before the law. If at any time he finds prolonged absence necessary he should then be required to employ another Registered Pharmacist to take his place as acting manager during that time.

The manager is necessarily the only person who has the authority to procure and replenish, or to direct or superintend the procuring or replenishing, of the drugs, chemicals and preparations to be dispensed in the pharmacy under his charge, and his training and experience must be correspondingly adequate, and the qualifications required of him must be higher than those of assistants. His acts are altogether his own; he is under no one else's supervision or direction, and he has no one to advise him.

The *clerk*, whether he be a registered pharmacist or a registered assistant pharmacist, is responsible only for his own acts. He is not responsible for the general condition and conduct of the store, nor for any of its contents. He is not its manager. He must

obey the rules laid down by his employer. He must use or dispense whatever materials may be furnished to him, and do his work with whatever tools and facilities may be at his disposal. He must do his work as his employer wants it done, whether his employer watches him do it or not. In short, he is an employé and agent, whatever his qualifications may be. He has the advantage of his employer's aid or advice if he needs it, and it is reasonable to assume that he does receive such advice, and that he is subject to such supervision as may be necessary to render his work satisfactory.

These differences seem to your Committee to be so self-evident that we would feel called upon to apologize for stating them were it not for the fact that they have been too often ignored to the serious detriment of the cause of pharmacy.

Registered Pharmacists hereafter licensed should, therefore, be graduates of reputable pharmaceutical schools.

This will in time elevate the character of the whole profession, increase the supply of clerks and yet improve their condition, enable the druggist to live like other men without slaving in his store sixteen hours out of twenty-four, and will attract a better grade of apprentices.

If graduation in pharmacy is not made obligatory the next generation of druggists will inevitably be much below the average of to-day.

Older druggists can testify to the fact that commercial conditions have aggravated the evil of an excessive number of stores and have rendered it more and more difficult to find satisfactory drug clerks or to give such clerks as we have a proper training. The time and attention of proprietors and managers are so taxed by the demands of business that it is now impossible to give adequate instruction to junior clerks and apprentices in the stores.

#### HOW TO PROVIDE MORE AND BETTER CLERKS.

The complaint that good drug clerks can not be found without the greatest difficulty is so general that it must be true. It is undoubtedly due in part to the great demand for clerks and other workers in all kinds of business. But it is also due in great part to the undesirable conditions created by the pharmacy laws and their interpretation and to the *long hours of work*.

It seems obvious to your Committee that in order to be able to secure desirable Assistant Pharmacists, and keep them, it is first of all necessary to cease treating them as mere apprentices in the eyes of the law, and to make the conditions of their employment at least no less desirable than they can secure in other lines of work.

The duties of the clerk in the average drug store are by no means unpleasant or onerous; but the hours are excessive. When nearly all other stores and offices are closed at six or seven o'clock in the evening it cannot be necessary to keep the drug stores open until ten or eleven o'clock. How can the drug clerk be expected to remain on duty several hours later than nearly all his friends and acquaintances unless his wages are correspondingly greater? This is a question which cannot be ignored. It must be squarely met. The owners of pharmacies should carefully consider whether it really pays to keep the stores open so many hours.

As to the social and legal status of the Assistant Pharmacist your committee believes that it is unjustly underrated in consequence of the peculiar character of the pharmacy laws and the rulings under them. The really important differences between the privileges, duties and responsibilities of employers and clerks in the drug business are great enough. It cannot be necessary to add to them by almost destroying the value of the Registered Assistant Pharmacist to his employer.

The Assistant Pharmacist is of no use if he cannot prepare, dispense and sell medicines in the absence of a Registered Pharmacist as well as in his presence. The ruling that he cannot do so is peculiar to this country, and it is, moreover, directly contrary to the daily

practice in every drug store where a Registered Assistant Pharmacist is employed. The only possible justification for the rule lies in the erroneous assumption that when his employer is personally present he directs and watches every detail of the work done by the Assistant. That is not only untrue but quite impossible. Every druggist knows that the Assistant Pharmacist in any drug store must of necessity perform his duties without any other supervision than that imposed by the general rules and established policy and routine of the establishment, and that his employer cannot and does not watch him except so far and so often as may be necessary to form a just estimate of the clerk's intelligence, skill and faithful attention to his duties. The certificate issued by the Board of Pharmacy to the Registered Assistant Pharmacist is of no value whatever if the holder is not qualified to render any service, and any work he may do when another person directs and watches his every move is not in reality done by him but by that other person.

A clerk who is competent to compound prescriptions when his employer is in the store does not suddenly become incompetent when the employer goes to his dinner or takes a day off. Neither does the clerk actually or in any legal sense take charge of the store when his employer goes out.

The Registered Assistant Pharmacist should not be placed in the humiliating position of a nobody. Let the fact be freely recognized that he is legally qualified to perform any and every duty which his employer may assign him connected with the preparation, dispensing and selling of medicines, and that the only privilege denied him by the law is that of performing the functions which would constitute him the real manager of a pharmacy.

There is no valid reason why the druggist should be compelled to employ a Registered Pharmacist to do a Registered Assistant's work, and no reason why a Registered Assistant should be treated as if he were but a beginner or apprentice.

#### QUALIFICATIONS AND DUTIES OF APPRENTICES.

Any druggist has the right to employ whomsoever he pleases to do any of the non-pharmaceutical work in his store, or to be the "shop boy." But an Apprentice is not merely a shop boy. Although he is and must be to a certain extent a bottle washer and errand boy and must do many necessary things which require simply ordinary natural intelligence and an honest willingness to work and to do the work well, the apprentice in pharmacy is more than that. He is to become, later on, an Assistant Pharmacist trusted to prepare medicine for the sick, and finally a Master Pharmacist conducting a drug store. He must, therefore, possess sufficient general education and mental efficiency to learn the art of pharmacy and the scientific principles without a knowledge of which it can not be intelligently, safely and efficiently practiced.

Apprentices can not be legally permitted to prepare or dispense medicines even under the personal supervision of Registered Pharmacists, but they must, of course, be allowed to *learn*. They must be given opportunity to see and participate in such services as may gradually initiate them into more and more technical duties such as they can safely perform under direct instruction and supervision.

Unless the beginner or boy in a drug store has that preliminary general education which will enable him to learn the art of pharmacy in an intelligent way he should not be allowed to think that he is an Apprentice, and his years of employment in the store, unless he is really an Apprentice, can be of no value to him beyond the wages he earns. But a qualified Apprentice receives much more than his wages, because he is in line of advancement and admission to an honorable technical calling.

#### THE APPRENTICESHIP SYSTEM OF PAST GENERATIONS IS NOW OBSOLETE.

The old system of apprenticeship, which in former generations served to recruit the

ranks of lawyers, physicians, pharmacists, dentists and many other occupations, has passed out of existence, because it is not applicable to present conditions and because more efficient methods have supplanted the old. Young men can no longer prepare themselves for the practice of medicine by studying in physicians' offices. The progress made in all branches of human knowledge has been so great that the educational preparation for all professions and occupations demands far more time and labor and far more effective means for its successful accomplishment than ever before, while at the same time those engaged in the professions and occupations are so strenuously employed therein that they can give but little if any attention to the training of their successors.

Professional, technical and industrial schools are now giving the instruction which was formerly given by employers and preceptors under the old apprenticeship system, and those schools do many times as much as any employer, and do it much more systematically and thoroughly.

One phase of the apprenticeship in pharmacy is, however, indispensable, and will always remain so in this as well as in all other countries, for the seasoned reliability and efficiency necessary in pharmaceutical practice to render it safe to the public can never be secured without actual service. Courses of study and laboratory training in the branches taught in the schools of pharmacy afford the best kind of *education*, but that must be supplemented by sufficient *practice* in drug stores where opportunity is given the apprentice or student to participate as a helper in real pharmaceutical work. Only the schools can give the instruction; only the stores can supply the practice.

#### WHY SPECIAL EDUCATION IN PHARMACY IS NECESSARY.

The reason why so many druggists have little or no really pharmaceutical work to do is that they do not possess the knowledge and skill necessary to do it, and do not have others in their employ who are any better trained. All druggists who have fair business capacity, and are also able pharmacists, can always make profitable use of their technical knowledge.

But a stronger reason exists why pharmacists must have a certain amount of special education and a certain degree of technical efficiency.

A person unable to understand the Pharmacopœia sufficiently to properly observe its standards and directions is not a competent pharmacist.

The Boards of Pharmacy should demand that the Registered Pharmacist of the future shall be able to read the Pharmacopœia understandingly.

The pharmacopœias of this age are of necessity scientific-technical manuals which cannot but be unintelligible to uneducated men, for they must keep pace with the progress in chemistry, pharmacognosy, and scientific pharmacy. The time has come when the pharmacist must begin to fall into line or he will soon fall by the wayside.

#### LET THE REQUIREMENTS FOR ADMISSION TO THE PRACTICE OF PHARMACY BE KNOWN.

Any citizen has a right to demand and receive explicit information as to the conditions upon which he may engage in any lawful occupation. It is, therefore, the first duty of every Board of Pharmacy to publish the conditions upon which admission to the practice of pharmacy may be secured, and to state those conditions in a clear, definite way, including information as to how those who desire to enter upon pharmacy may suitably prepare themselves for that occupation and for the examinations prescribed under the pharmacy laws.

Whatever the prescribed conditions may be, they should be consistent with each other. In several existing laws they are inconsistent: and in all, or most of them, they are vague.

The conditions or qualifications specified relate to:

1. Age.



2. Preliminary general education.
3. Special education in pharmaceutical schools.
4. Length of service or "practical experience" in drug stores.

Differences arise mainly from the fact that some of the laws prescribe the qualifications of only Registered Pharmacists; other laws add the class known as Registered Assistant Pharmacists; and only a few laws mention also the Apprentices.

But, as the laws now read in most of the states, the Registered Assistant Pharmacists are in fact treated as if they were only Apprentices, for it is ruled that they can not legally perform any pharmaceutical service except under the immediate supervision and in the presence of a Registered Pharmacist. Your Committee recommends that the Assistants be made as serviceable as "fully registered clerks" are now, and that the Apprentices be made as serviceable as the Registered Assistants are now. This is readily accomplished if the standard of educational requirements for full registration be raised by including graduation from a reputable school of pharmacy.

The immediate result would be higher respect for pharmacy as a profession because of the graded system of registration and advancement of its workers. It could, then, no longer be said that the master pharmacists (drug store proprietors or managers) of the future will be of a lower grade than those of the present on account of the fact that the old apprenticeship system is dead and that no other method has taken its place.

The upward tendency of pharmacy as an occupation would begin at once. Its progress would probably be slow at first, but in a few years we should certainly have a smaller number and higher grade of drug stores, an increased number of assistant pharmacists fully qualified to discharge all the duties that should be performed by drug clerks, and a better supply of beginners.

#### THE AGE REQUIREMENTS.

It is absolutely necessary that the minimum age of Registered Assistant Pharmacists shall be that of legal maturity, because all persons permitted to prepare, dispense and sell all kinds of medicines, including narcotics, must be legally responsible agents and should be old enough to warrant the expectation that they possess sufficient discretion and a realizing sense of the serious nature of what they are doing.

It is not only quite unnecessary but disadvantageous to fix the minimum age of Apprentices or of Registered Pharmacists provided the preliminary general education of the former is made sufficient, and the qualifications of the latter made to include some service as Registered Assistants. All the other qualifications prescribed for all grades should be consistent with the minimum age of Assistants. The whole plan should as far as practicable be such as to do equal justice to all persons entering upon the occupation of pharmacy, and to encourage respectable standards of education. There need be nothing in the law to prevent the employment in drug stores of any apprentice at any age if the preliminary education of that apprentice be not below a prescribed minimum and the period of his apprenticeship sufficient according to that preliminary education so that he continues to be only an apprentice until 21 years of age.

#### PRELIMINARY GENERAL EDUCATION.

The irreducible minimum of preliminary general education of apprentices should be one year's completed high school work or its full educational equivalent, by which is meant the amount and grade of school work represented by not less than six hundred hours' instruction in the subjects usually taught in the public high schools and preceded by the completion of the primary school courses prescribed for admission to the high schools. It does not matter whether the high school work required be done in high schools or elsewhere.

Ours is the only civilized country which does not prescribe high school graduation as a preliminary admission to apprenticeship in pharmacy.

Students of medicine are not admitted to reputable medical schools unless they possess a preliminary education equivalent to that prescribed for graduation from a four years' high school course, and many of the leading medical schools now require for admission to their courses one or two years of college work in addition to high school graduation.

Boys finish their grammar school grades at about the age of fourteen, and accordingly their first year's high school work at fifteen. Many reach that stage earlier. The mental efficiency of children at that age is altogether insufficient for reasonably successful apprenticeship in pharmacy unless supplemented by correspondingly longer training for the grade of Assistant Pharmacist.

While it may be impracticable at this time to demand more than one year's high school work for admission to apprenticeship in the drug stores in all states, it is nevertheless highly desirable that something be done to encourage the admission of a better grade of material, out of which to make the pharmacists and assistant pharmacists of the future.

The state of South Dakota leads all other states in respect to the preliminary general education required for pharmacy. In that state no license to practice pharmacy is now issued to any person who has not successfully completed at least three years' high school work, and the Board of Pharmacy announces that *after January 1st, 1909, high school graduation will be required*. Several years were required to reach this highly satisfactory standard, but it was accomplished by a steady gradual approach with the approval of the druggists of the state, and there can be no doubt that South Dakota has thus laid a strong foundation for greatly improved conditions in the drug business, not only educationally, but morally and commercially as well.

The law of Michigan requires two years of high school work.

All schools of pharmacy which are members of the American Conference of Pharmaceutical Faculties, including nearly all the oldest colleges of pharmacy, refuse admission to all persons with less than one year's high school work, and some refuse admission to all but high school graduates. Yet these schools have a large number of students, nearly all of whom come from the drug stores.

In the opinion of your Committee high school graduates should be enabled to fulfill all requirements for registration as Registered Pharmacists in four years; those who have three years of high school work in five years; those who have had two years' high school work in six years, and those who have had only one year's high school work should reach the grade of Registered Pharmacist in seven years.

This method is just and right, because the students in the primary and secondary schools cannot earn any wages while at school, whereas apprentices and clerks in the drug stores earn at least their living expenses. The boy who leaves school earlier should not be rewarded for it by being enabled to secure his registration papers earlier than he who prepares himself better for his occupation, and the latter should not be punished by having to wait for his registration papers until a later age.

The objection sometimes raised that some of the subjects taught in the public schools, such as history, geography, etc., are of no use in pharmacy is unworthy of notice, for the sole object of the preliminary general education is the attainment of sufficient mental development and efficiency. It is to put the mental machinery into reasonably effective working order. If that end is gained it matters little what means were employed to gain it. Pharmacists have direct use for a knowledge of botany as an introduction to the study of plant drugs; but in the preliminary education the proper and necessary training of the powers of observation may be acquired just as well in the study of bugs as in the study of plants.

#### CREDITS FOR SPECIAL EDUCATION.

Existing pharmacy laws do not in any state demand college education in pharmacy

except for the highest grade—that of Registered Pharmacist—and for that grade only in New York and Pennsylvania.

Many pharmacy laws count the time devoted to college courses in pharmacy as at least equivalent to the same amount of time devoted to drug-store experience; in some states the college attendance is counted as worth one and one-third times as much as the same time spent in the store. Your Committee proposes that all time necessarily required for the successful *completion* of regular courses of study in reputable pharmaceutical schools be credited as equivalent to the same amount of net time in drug stores toward the fulfilment of the requirements for the registration of assistants, and that graduation in pharmacy be made a compulsory requirement for the licensing of Registered Pharmacists.

No credit should be given for any time devoted to college courses unless the student was in regular attendance through the whole annual session, and completed satisfactorily all the studies embraced in the regular program of work for that time in the school he attended.

Fragmentary, partial, unfinished or unsuccessful college work must be regarded as of no educational value. A student who has not received passing grades at the school he attended should not be given credit for his school work elsewhere.

Students who do not finish their school work successfully should stand in the same position before the Boards of Pharmacy as if they had never attended any school.

#### THE DRUG-STORE PRACTICE REQUIRED FOR REGISTRATION.

The "practical experience" or drug-store service prescribed by the pharmacy laws must be such as can be properly construed as pharmaceutical practice. It is so important that the Boards of Pharmacy should verify it in every case from direct evidence. Graduation from a college requiring drug-store experience should not be accepted as sufficient evidence of such experience.

Under existing pharmacy laws the drug-store service required for the grade of registered assistant pharmacist varies from none to three years, being in most cases two years. The drug-store service required of registered pharmacists is in some states none, in other states from two to five years. In most states it is four years, including all time devoted to courses in pharmaceutical schools.

Your Committee is of the opinion that the drug-store service, or shop-apprenticeship, required for the registration of assistant pharmacists should in no case be less than two years, *exclusive of any college attendance*, and in no case less than  $2\frac{1}{2}$  years for the grade of registered pharmacist. The total number of years occupied by high-school work, college courses in pharmacy and drug-store practice which should be required of all candidates for license as registered pharmacists should (added together) in no case be less than eight years.

We call particular attention to the fact that the boy who enters the drug store after only one year's high school work, and who does not attend any school of pharmacy before he seeks registration as an Assistant Pharmacist, can earn his living through the whole period of years while preparing for that registration, so that his preparation costs him nothing, while the high school graduate who obtains a far more thorough education does so at the cost of four years' wages and his college fees and living expenses for one and one-half years.

#### REGISTRATION OF APPRENTICES.

Apprentices should be registered because their fitness should be verified.

The examination of persons reported as apprentices, or of applicants for registration as such, is quite superfluous whenever certificates of the school officers are furnished. All such examinations, when necessary, should be held in or near the city or town where the candidate lives.

The requirements in regard to the preliminary general education of apprentices and students should, as far as practicable, be identical and so definitely stated in the blanks and records of the Boards of Pharmacy and the pharmaceutical schools that the certificates of Boards and schools may be interchangeable. In other words, the Boards and the schools registered by them as in good standing should honor each other's certificates, so that apprentices registered by the Boards should be admitted as students by the schools and matriculates of the schools should be entitled to registration as apprentices.

Certificates of registration of Apprentices issued by Boards of different states should also be made reciprocal so far as possible by making the requirements, papers, and procedures connected therewith uniform.

#### THE STATE EXAMINATIONS IN PHARMACY.

The subjects which might be included in the scope of the examination of candidates for registration as pharmacists are the following:

*A. Botany, Pharmacognosy and Materia Medica*, including pharmaceutical microscopy in connection with the examination of drugs and their powders, the general medicinal properties of drugs and medicines, doses, and elementary toxicology (what medicines are poisonous, their general action and antidotes).

*B. General Inorganic Chemistry*, theoretical and descriptive, including chemical notation and equation writing.

*C. Analytical Chemistry*, including qualitative analytical methods, the practical application of the purity tests of the Pharmacopœia, so much of quantitative analysis as concerns pharmaceutical work and especially the application of the pharmacopœial volumetric test solutions, and the principles and practical details of official processes of assay of drugs and preparations.

*D. Elementary Organic Pharmaceutical Chemistry*, including sufficient knowledge of the structure, classification and properties of the compounds important in pharmacy.

*E. Weights, Measures and Specific Density*, together with pharmaceutical arithmetic and ability to solve the pharmaceutical and chemical problems occurring in practical work.

*F. Theory and Practice of Pharmacy*, including the general scientific principles, processes and manipulations, pharmaceutical preparations, inorganic pharmaceutical chemistry, and the inorganic chemical preparations, the constituents and pharmacy of the plant drugs, pharmacy of the organic chemical compounds, pharmaceutical nomenclature and its latinity, prescriptions and their construction and interpretation, and ex-tempore operative pharmacy, including the art of dispensing.

But while the subjects here enumerated and others besides (as, for instance, physiology, bacteriology and antitoxins, commercial pharmacy, etc.) are taught in the pharmaceutical schools, only those of the greatest importance are usually included in the State examinations. In fact, your Committee is of the opinion that at this stage of the progress of legal regulation and verification of the educational qualifications of pharmacists, and especially in view of the fact that systematic pharmaceutical education has not yet been made compulsory, the State examinations must continue for many years to be rather elementary, and that some of the subjects now occasionally included in these examinations ought to be omitted, as, for instance, systematic botany, the therapeutic applications of individual drugs and preparations, etc.

#### THE STATE EXAMINATIONS IN PHARMACY SHOULD BE BASED PRIMARILY UPON THE PHARMACOPEIA OF THE UNITED STATES,

and should not include anything that is not necessary to the proper understanding and use of the text of that book and the due observance of its requirements, or to the efficient performance of the practical details of preparing and dispensing medicines.

No question should be asked which does not serve to test the practical efficiency of

the candidate, *i. e.*, his ability to intelligently apply general principles and to do work. No question should be asked which is of such character that the answer to it, whether correct or incorrect, can have no bearing upon the candidate's fitness. Good memory is extremely valuable, and important laws and facts having a general bearing or frequently used must be kept in the memory, but isolated facts of which application is not frequently made need not burden the memory of practical men.

Competent men know how to use reference works, and it is not only unnecessary but impossible to remember the numerous very important facts which every intelligent worker can find at a moment's notice. The Pharmacopœia is a book of standards and the authoritative guide for the use of pharmacists; but it is also to a very great extent a reference book. No sane pharmacist would waste his time on an impossible task, trying to memorize the contents of that book.

The efficient pharmacist is he who remembers highly important things for which he has constant use, who knows where and how to find any other facts he may require for occasional use, and who understands the meaning of what he finds and how to use the information intelligently and effectively.

Questions which test the candidate's efficiency are always incidentally sufficient to test his memory, too.

A most rational, fair and effective examination could easily be based exclusively upon the text of the Pharmacopœia, with that book in the hands of the candidate, oral questions being asked of him to test his ability to correctly understand and apply it. The extent to which oral examinations are practicable depends to a great extent upon the number of candidates examined. But written or printed questions can be framed which are of the same character.

Practical processes and formulas for pharmaceutical and chemical preparations which are common and important should be selected which are well adapted for examination purposes, and should be placed before the candidate to be explained. Formulas enumerating ingredients to be used in making some given product, but containing no directions as to *how* the preparations may best be made, should be employed, the candidate to supply the missing directions in detail. Problems in pharmaceutical and chemical arithmetic should be freely used, and of all questions in chemistry probably none can be more useful or effective than such to test the candidate's ability to fully comprehend and correctly use chemical formulas and equations.

Prescriptions, written expressly for the examinations, should also be freely employed to test the candidate's ability to understand them, to detect errors, wrong doses, incompatibilities and other defects, and to explain fully how they should be dispensed.

Practical operations in the making of preparations, dispensing of prescriptions, applying chemical tests, etc., should be introduced as far as may be found practicable.

Among the methods occasionally employed which are unsuitable may be mentioned the identification of drugs by their appearance, odor and taste, and the reading of almost unreadable prescriptions. These tests should be wholly discontinued.

The number of questions asked in each subject should depend upon its relative importance, and the total number of questions should depend upon the time probably required to answer them sufficiently fully. Chemistry and pharmacy are the most important subjects.

Candidates for registration as Assistant Pharmacists should be thoroughly examined upon pharmacy. They should be required to prove a fair elementary knowledge of inorganic chemistry. They should be able to quickly and properly solve problems in weights and measures, specific gravity and pharmaceutical arithmetic. The examinations to which they are subjected should be such as to test their intelligence, knowledge and efficiency as practical preparers and dispensers of medicines.

Candidates for registration as Registered Pharmacists should know all that Assistant

Pharmacists are required to know, and in addition should have a good working knowledge of pharmacognosy, analytical pharmaceutical chemistry and elementary organic chemistry, and should be able to read the Pharmacopoeia and carry out its directions understandingly.

Graduates of reputable pharmaceutical schools should be excused from all examinations except those intended to test their reliability and efficiency in the actual performance of the daily duties of pharmaceutical practice, not only because they must have already passed satisfactory examinations in all branches, but because it is absolutely necessary that systematic special education for pharmacy shall receive substantial credit and encouragement. This was unanimously recommended by the Joint Conference of Boards and Schools of Pharmacy at New York in 1907.

The State examinations in pharmacy should be uniform or absolutely identical in as many states as possible, so that any candidates having passed in one state will not have to be subject to another examination in another state which may be able to agree to this reciprocity plan. This does not mean an interchange of certificates of registration between states in which the legal requirements for registration differ; it simply refers to exemption from repeated examinations.

The National Association of State Boards of Pharmacy could easily appoint a standing committee to prepare such questions as may be used in printed form, and to supply sets of those questions to all boards which may voluntarily decide to make use of them. From four to six different sets of questions for each grade would be amply sufficient each year (a different set for each examination), and all the boards using these questions can hold their examinations on identical dates, so that there may be no possibility that the questions may become known before they have been used by all of those boards. In addition to the great advantage of interstate uniformity and reciprocity to all candidates, the adoption of this plan would also result in economy of time, labor and money. The same committee might advantageously be employed to rate the papers of the candidates.

All state examinations in pharmacy should occupy sufficient time, and all candidates should be given ample time to prepare their written answers carefully and deliberately, and ample time should be devoted to the rating of the papers and the findings of the boards.

The state examinations in pharmacy and the courses of instruction given in the schools of pharmacy should be in agreement to the extent that all subjects included in the examinations should be taught in the schools. There is no doubt that a mutual understanding to that effect can be brought about.

#### EXAMINATION RATINGS.

It is customary to rate the answers of the examinee in numbers on a scale of 100 points, *i. e.*, in per cent. This method has many defects, but is convenient and useful when applied by the examiners in accordance with a consistent plan and *solely for their own use*. It is, however, evident that the percentage system of expressing the standing of students and of candidates for license cannot convey a definite meaning, for a rating of 100 (perfect) upon an examination consisting of easy elementary questions, may express a much lower grade than a rating of 50 on more searching or advanced questions. For this reason, among others, that method is wholly inapplicable for the purpose of expressing the actual proficiency of the examinee to persons having no knowledge of the character of the questions asked. Many of our leading educational institutions have adopted *the plan of using only the expression "passed" and "not passed,"* and although this method of expression is also far from definite, it is less objectionable than the other.

It cannot be the duty of Boards of Pharmacy to inform candidates of their percentage ratings in the several subjects upon which they are examined, nor their "general

average" expressed in per cent. It would seem to be preferable to simply inform them whether they have passed or not.

Another phase of the question of examination ratings which should be considered is the required minimum in each subject as well as the required minimum general average. No candidate should be given a passing grade as a general average if he falls below a given minimum rating in any single subject. In several states the examination is divided into several distinct parts, the written examinations on materia medica, chemistry and pharmacy constituting three of those parts, the oral examination another part, the identification of specimens the fifth, and the practical test in dispensing the sixth part. Assuming that the required minimum general average is 75, it will be seen that a candidate receiving as low a mark as 40 on each of two of the most important subjects could still pass on the whole, which would be absurd.

#### RATINGS ON QUALIFICATIONS NOT COVERED BY THE EXAMINATION.

In the final determination of the fitness of any candidate to be licensed as a Registered Pharmacist or Assistant Pharmacist, all qualifications having a direct bearing upon the question should be considered, such as the extent of his preliminary general education, the character and scope of his special education in professional or technical schools, the character and extent of his practical experience in pharmacy, and any practical experience he may have had in laboratories where pharmaceutical preparations are made or tested, etc.

The same young man is more mature at 25 than at 18; several years' high school work brings greater mental efficiency than one year's work; one year in college means more than one year in high school; ten years' experience in a good drug store is worth more than three years in the same store; 2,000 hours' instruction is worth more than twice as much as 1,000 hours in the same school; one year in a good school may be better than two years in a poor one; experience at the prescription table has its value, while experience at the soda fountain should not be counted at all; one year's experience in a first-class pharmacy may be worth more than ten years in another drug store, etc. All of these factors should receive due consideration.

#### THE EXAGGERATED IMPORTANCE ATTACHED TO EXAMINATIONS.

Custom, long indulged, sometimes causes us to forget its real meaning, purpose and origin. In our country we have a curious and heedless habit of placing examinations above actual training. The results of examinations are commonly regarded as quite sufficient in themselves. Examining bodies often act upon the assumption that it is wholly unnecessary to inquire into the actual training of the person examined. They hold that if the candidate can pass the examination successfully that fact proves conclusively that he possesses the degree of efficiency called for, and that it is of no consequence how that efficiency was attained, and, therefore, altogether unnecessary to inquire whether or not he ever had any systematic education. That assumption would not be so disastrous if the examinations could be made perfect and infallible, but the fact is that perfect and infallible examinations are extremely difficult to frame and require far more time, thought and skill than are bestowed upon them. With regard to the licensing examinations in pharmacy, your Committee finds that it is scarcely possible that they can be conclusive tests, because as a rule they occupy an altogether insufficient time and the cost of the equipment and labor necessary to make them so nearly right as to render it unnecessary to require any other proof would be prohibitive. Such perfect examinations, moreover, could be planned and conducted only by such adept, experienced and wise examiners as are probably rare even among educators by profession.

It is, of course, true that grossly unfit men can be easily enough recognized by their examination papers, but it is also true that efficient men may be and often are rejected and that inefficient men are often able to pass if they are lucky and successful crammers.

In discussing this question your Committee is governed wholly by a desire to discover the right method on general principles, and we can not but believe that the important requisite is the education or training and that the examination is simply one of the means by which the extent and value of that training may be discovered, at least approximately, if the examination is well conducted. Examinations as ordinarily conducted, not by pharmacy boards only but by many other examiners, do not reliably verify the *efficiency* of the candidate, which is always the product of training and development, but only discover his knowledge of some facts. We are, therefore, unequivocally of the opinion that certain fixed courses of systematic special education in proper pharmaceutical schools should, in our country as in all others, be prescribed, including an adequate proportion of laboratory instruction.

In weighing the value of examinations it should never be forgotten that persons who may have attained a high degree of maturity and efficiency by systematic and effective courses of education not only may retain their efficiency but may continue to grow more efficient although they invariably forget many things which were necessary means of arriving at the state of development they had attained at the close of their course of education. Most men are far more efficient and reliable at 40 than at 20, but their memories at the age of 20 held many facts which they must lose as soon as they no longer make a special effort to retain them.

In passing judgment upon the durability of a house we never inquire into the kind of scaffolding used in building it.

#### QUALIFICATIONS OF MEMBERS OF THE BOARDS OF PHARMACY.

Members of the Boards should be well-known pharmacists of at least five years' experience, and men of good education, broadminded and capable. It is not necessary that they should possess the exceptional qualifications necessary to examiners upon such technical and scientific subjects as chemistry, pharmacognosy and other branches of science connected with pharmacy, for the Boards of Pharmacy have more important duties to perform which require as much of their time and attention as they can reasonably be expected to give for the meagre compensation they receive, and they can and should employ others, specially fitted for it, to perform the work of preparing examination questions and rating the papers of the candidates. The persons so employed would do their work under rules and directions adopted by the Board, which should exercise such supervision as may be necessary, and, as the final decision in every case must rest with the Board, there can be no objection to this plan.

As the pharmacists themselves pay the whole cost of the administration of the pharmacy laws, and as practical familiarity with the details of pharmacy and the conditions affecting the duties of that occupation are necessary qualifications, members of the Boards of Pharmacy are generally appointed upon the recommendation of the State Pharmaceutical Associations, several nominees being presented to the appointing power to fill each vacancy.

But the nominations must be made intelligently and carefully. Lists of all candidates proposed should be printed and distributed among the members about two months in advance of the time when the vote is to be taken, giving name, residence, age, education, practical experience in pharmacy, and other facts bearing upon the qualifications of each candidate, together with the name of the person or persons recommending him. In no other way can an intelligent vote be taken.

Only men able to maintain the dignity of membership of a State commission, to command the respect due their position, and fit to use wisely the power conferred upon them, should be named.

#### POWERS AND FUNCTIONS OF BOARDS OF PHARMACY.

The Boards of Pharmacy represent their respective State governments and are clothed



with all the discretionary powers necessarily conferred upon them by the requirements of the pharmacy laws. The Boards are charged with the duty of enforcing these laws, which are enacted for the protection and benefit of the public.

The Boards must interpret the law before they can enforce it. It is their duty to inquire into all essential details concerning the sufficiency of the education, special training, practical experience, and other qualifications of all applicants for registration, and to examine them in any way and to any extent deemed necessary, and they have the power to do all these things in their own way, their power being limited solely by the recognized principle that the intent and object of the law must be carried out, and that the methods employed to that end and the standards and requirements fixed by the Boards shall be reasonable and just as well as sufficient.

The pharmacy laws rarely specifically forbid the licensing of criminals, insane persons, habitual drunkards, drug slaves, illiterates, and others clearly unfit to practice pharmacy without grave danger to the public; yet common sense dictates that all such persons must be denied the right to engage or remain in that occupation.

The Boards must accordingly have wide discretionary powers, and must make and publish from time to time such rules and regulations as may be necessary.

As proper pharmaceutical training is the chief means by which the protection of the public against the dangers of incompetent and irresponsible handling of drugs and poisons must be secured, it is the duty of the State, through its Board of Pharmacy, to foster education for this hazardous special occupation, and to make such education obligatory to the extent to which it is necessary.

It is the duty of the Boards of Pharmacy to inquire into the character and extent of the courses of instruction given in the pharmaceutical schools, and to prescribe definite rules and regulations which such schools must observe in order to receive recognition under the pharmacy laws.

Like other public commissions the Boards of Pharmacy should give interested parties a hearing upon questions of the law and its enforcement. The Boards of Pharmacy should, therefore, invite pharmacists, pharmaceutical educators, and pharmaceutical associations to consult with them and to offer such suggestions as they may deem pertinent. The Boards of different states should also confer with each other.

Among the onerous important duties of the Boards is that of preventing violations of the law, such as the selling of medicine or poisons without a license, the illegal sale of habit-producing drugs, etc. It is important to the public health that bar keepers in the liquor saloons shall be prevented from recommending and selling "headache cures" and other dangerous medicines, etc.

The preparation and revision of proper blanks and circulars, to be used in the transaction of the Board's business, renewals of certificates of registration, the keeping of complete records and files, the publication of reports and statistics, the correspondence and other miscellaneous duties of the Boards, require much work and proper direction and supervision.

The records of the Boards should be sufficiently complete and so kept that important statistics of public interest may be easily compiled and tabulated from them, and such statistics should be published in the annual reports.

So much important and necessary work requires the attention of the members of the Boards of Pharmacy that they should not burden themselves with any details which are unnecessary or which can be attended to by other persons employed by them.

The members of the Boards are generally compensated for their services by a fixed per diem allowance while actually engaged on the business they must transact. It is always small, but competent men can undoubtedly always be found who are public-spirited and unselfish enough to faithfully perform the duties of Board members, content with the satisfaction of useful work well done and the honorable distinction which attaches to any

similar public office when filled by a competent and faithful man. The per-diem compensation allowed the Board members applies to attendance upon all necessary meetings, public hearings, time necessarily devoted to committee work, the expenses of delegates to the meetings of the National Association of Boards of Pharmacy, and other public conventions of recognized leaders in pharmacy and pharmaceutical education.

#### HOW THE BOARDS CAN ENCOURAGE EDUCATION.

They can advise apprentices and clerks to attend reputable pharmaceutical schools as one of the necessary means of proper preparation for the practice of pharmacy. They can foster sound pharmaceutical education by giving no aid or encouragement to cramming institutions or to inferior or unfit schools. It is undoubtedly a fact that the Boards of Pharmacy have the power, without specific mandatory provisions of the law, to require such minimum courses of educational preparation as may in their opinion be necessary to the attainment of that efficiency without which pharmacy can not be practiced with safety to the public.

The good schools of pharmacy, we are convinced, stand in absolute need of proper recognition and support.

The equipment necessary to an efficient school of pharmacy is very costly. All well-established schools of that kind have their equipments; but there is unfortunately no check upon the establishment of new schools without facilities for good work. There are at this time about ninety American pharmaceutical schools. No good and efficient school of pharmacy is self-supporting—that is, its income from tuition fees is never sufficient to cover actual and necessary current expenses, unless the school is fortunate enough to possess a home of its own so that it has no rent to pay, or sufficient endowments or other incomes, or public appropriations for its support. Every good school of pharmacy uses all of its income for educational purposes.

Unwholesome conditions still exist in pharmaceutical education. Fully one-half of our pharmaceutical schools might be closed with great benefit to the cause of education. There is no danger of any ill results arising out of the suppression of more than one-half of them. The most flourishing good schools would still be barely self-sustaining.

Our most populous states can not support more than four pharmaceutical schools in a condition of respectable efficiency, some of the states could not support more than one, and several states are too small to support any. But one of our states has eight such schools, another five, and so on.

Members of all Boards of Pharmacy should be posted upon all important matters concerning pharmacy and the pharmaceutical schools. They should be members of the American Pharmaceutical Association and attend its meetings. They should personally visit and inspect as many pharmaceutical schools as possible, good and bad, large and small. They would then discover the enormous differences between them. They would learn many things which must convince them that schools and colleges of pharmacy can not be indiscriminately "recognized," and that such indiscriminate recognition must eventually strangle many of the oldest and soundest of our pharmaceutical schools to the shame and great injury of American pharmacy.

The Boards of Pharmacy, and they alone, have the power of the states behind them, and all they have to do to encourage sound education is to refuse to extend any credit for work done in schools which do not comply with reasonable educational requirements.

Full credit should invariably be given for substantial courses in good schools.

#### RULES GOVERNING THE RECOGNITION OF PHARMACEUTICAL SCHOOLS.

The following rules, based upon the requirements of the American Conference of Pharmaceutical Faculties (including nearly all colleges of pharmacy which have been in existence more than twenty years) and those of the Educational Department of the State of New York, under the law of that State, have been adopted and promulgated by the Board of Pharmacy of Illinois, and are extremely moderate:

1. The school must be a legally incorporated or chartered educational institution or a department governed by such an institution.
2. It must possess an equipment of furniture, fixtures, apparatus, books and materials for its pharmaceutical courses to the value of not less than \$5,000.
3. It must give reasonably adequate courses of instruction in the subjects usually taught in pharmaceutical schools, which subjects shall include at least pharmacy, chemistry and materia medica.
4. It must have not less than three teachers, of sufficient education, special training and experience, and at least one of these teachers shall have had not less than five years' experience in pharmacy.
5. The obligatory courses for graduation shall include not less than 500 hours of lectures and recitations, and not less than 600 hours of laboratory instruction, and shall extend over two annual sessions of at least twenty-five weeks each.
6. The course of instruction must be given in proper logical sequence, according to approved educational methods.
7. After July 1, 1908, the entrance requirements shall include a preliminary general education of not less than one year of satisfactorily completed high school work, or its full educational equivalent of studies of similar grade in academies or other schools or colleges.
8. Only schools maintaining day sessions are recognized.

It will be seen that these rules wisely omit the condition that the schools must include "drug store experience" as a requirement for graduation. All respectable schools of pharmacy subscribe to the proposition that sufficient practical experience of the right kind is a necessary requirement for *registration* but less than a half dozen schools require it for *graduation*.

Several things are necessary to make a school of pharmacy efficient, but drug store experience as a graduation requirement is evidently not one of them. It is entirely possible for the poorest school of pharmacy in existence to demand drug store experience for graduation and for the best school not to require it. No man who knows enough about the pharmaceutical schools of our country to give his opinion any weight can deny that if the line be drawn between schools that base their diplomas in part upon drug store training and schools that do not, several of our best schools will be found on either side of the line and several of the weakest as well. It is, therefore, evident that any pharmacy law which calls upon Boards to exempt from examination the graduates of schools retaining the drug store experience requirement for graduation and to deny that recognition to the graduates of all other schools, must be regarded as wholly obsolete, stupid, unjust, in many cases discriminating in favor of inferior schools and against better schools, and thereby defeating its own ends.

#### MUST THERE BE TWO KINDS OF DRUGGISTS AND TWO KINDS OF DRUG STORES?

New York has now two kinds of druggists—"Licensed Druggists," and "Registered Pharmacists," distinguished from each other by different educational requirements and correspondingly different rights and privileges under the law.

It has been suggested in the pharmaceutical journals that the final outcome of the unsatisfactory condition of American pharmacy and pharmaceutical education will lead to a clean-cut separation of the purely commercial drug stores from the pharmacies where physicians' prescriptions may be dispensed.

This can be prevented only by early and substantial improvement and higher standards of pharmaceutical education for all persons licensed to conduct drug stores.

EUGENE E. EBERLE, Dallas, Texas.

SAMUEL L. HILTON, Washington City.

FREDERICK W. MEISSNER, JR., La Porte, Ind.

ALBERT M. ROEHRIG, Stapleton, L. I., N. Y.

OSCAR OLDENBERG, Chicago, *Chairman*.

*Committee.*

Mr. Oldberg's abstract of the report just presented was received with hearty manifestations of approval.

The Chair called attention to the fact that the Chairman of the Committee on National and State Legislation had intimated the desirability, possibly, of abolishing the committee, but in view of the exceedingly able and comprehensive manner in which the committee had analyzed the existing conditions, the report showed the committee should not be abolished, but should be most emphatically continued. He said the paper was now open for discussion.

Mr. Hallberg, discussing the paper, said he knew most of members were so timid that they did not like to start discussions, but he was always ready! He related the following incident bearing on one of the points made in the committee's report, that had come under his personal observation:

A child four years old, which was being treated by a physician, died very suddenly, after taking two doses of a medicine prescribed. The child was of Italian parents, and lived in "Little Italy," in Chicago, and the physician was an American. There was some feeling in the neighborhood because an American physician had been called into the case. The prescription had been put up by an Italian pharmacist, and the report became current that there was something the matter with the medicine. This report came to the ears of the attending physician, and he had the remainder of the medicine seized, and had it examined at the State laboratory, with the result that ninety per cent. of it was found to be carbolic acid. The physician had prescribed one ounce of creosote, to be given in the ordinary doses. The child was given this supposed creosote, and after the second dose had been given, and several hours had elapsed, it died under violent symptoms. The case was brought to the coroner's attention and the body was exhumed, and Mr. Hallberg was called in to testify as to the difference between carbolic acid and creosote. This Italian pharmacist—a registered pharmacist in the State of Illinois—first said the prescription was originally written for carbolic acid; next he said, "What is the difference between carbolic acid and creosote? they are both creosote, except one is coal tar creosote, and one is wood creosote." When he discovered that would not do, he said he took it out of a bottle labeled "Creosote," and that was all that was expected of him. He got this from a wholesale house, and dispensed it from this bottle. Before the coroner's jury Mr. Hallberg was asked by the coroner the definitions of creosote and carbolic acid, which he gave, and made the point that fifteen or twenty years ago, when creosote was used simply for toothache, it was not so risky if the creosote was all carbolic acid, or half carbolic acid; but, during the last ten or fifteen years, creosote had come to be regarded as about the only remedy that seems to have any satisfactory result with tuberculosis—with which the child in question seemed to be

affected—and he thought that any pharmacist who would, under these circumstances, dispense anything but pure creosote when it was called for, who would not satisfy himself and be sure that it was creosote, and not carbolic acid that was prescribed under these conditions for internal use, was absolutely unworthy of a license, in fact, his license should be taken away from him, and he should not be permitted to practice pharmacy.

A doctor who was present at this investigation, as a witness for the accused doctor, had said to the speaker that he traveled all over the city consulting with other physicians as a diagnostician, and, therefore, wrote prescriptions that went all over the city of Chicago, and he was very much disappointed at finding a state of facts existing as appeared at this trial. It was not that way ten or fifteen years ago. He never carried any medicines with him, except a few hypodermics, and he did not want to; he always wrote his prescriptions, and never prescribed proprietaries; but if this thing continued, "God knows," he said, "what I will do."

The question is, "Shall pharmacists lose the benefit of this whole movement? because the doctors will surely be dissatisfied and offended, if they cannot get uniform preparations of the U. S. P. and N. F.; if, because of the carelessness or inability of the pharmacist, they cannot get reliable preparations. Unless the pharmacists of the country do something to radically change the present situation, this whole movement, the speaker was afraid, would largely fail.

Mr. Searby, discussing the paper, said he had just received a letter from the President of the California State Pharmaceutical Association, enclosing a copy of a circular sent to every pharmacist in his State, to the effect that efforts will be made at the next session of the Legislature to amend their pharmacy laws. He would very much like that every pharmacist in California should receive a copy of this report of the Committee on National and State Legislation, so that they might act intelligently in the effort they are about to make to secure amendment to their pharmacy laws. They have a law in California requiring five years' experience before the applicant can take his examination for licensure, and yet they have registered scores of men that no member in this room would think of having as a clerk. Great reliance is placed upon "experience" there, but without a practical examination it is impossible to form a correct estimate of what a man may actually know, or what he will actually do when put behind the prescription counter.

He was aware that to publish this lengthy document, and give to it such a wide distribution as he would like to see, would cost the Association some money; but if the amount was not too large he thought it would be an exceedingly wise expenditure of money. He thought the Association was indebted to Mr. Oldberg for having called attention in a very pointed way to the unsatisfactory conditions of affairs as affecting pharmacy to-day in these particulars, and thought it important that, as far as possible, correct

ideas should prevail, in order that pharmacists, as they make efforts to improve the pharmacy laws in the different states, may act with the highest degree of intelligence. He hoped, therefore, that when this matter came before the Association in general session for action, the expense would not be considered as a bar to its being disseminated, so that every druggist in the United States might receive a copy. The druggists of the country need to be aroused? He knew that a very large number of druggists are opposed to anything approaching a pre-requisite law. The committee's report gives figures in regard to the number of licensed pharmacists in the states. He was sorry he had not the figures for his state, but they had about one thousand drug stores, and between three and four thousand registered pharmacists, and what they were all doing he did not know.

Mr. Oldberg suggested that this same condition was true in a good many of the states.

Mr. Searby, continuing, said he thought that fact afforded food for serious reflection, for it boded no good for the future of those already engaged in business in such states.

Mr. Mayo said that, in order to get the matter in concrete shape, he would offer the following resolutions:

"Moved that the report of the committee be accepted as a report on progress, and that the committee be continued, and instructed to prepare a report along the lines proposed, and that the Section recommend that the Council authorize the publication of this report, when finished, in the *Bulletin*, and the distribution of copies of this *Bulletin* to every druggist in the United States, including the members of every Board of Pharmacy."

This motion was seconded by Mr. Searby and several other members.

Mr. Searby thought that the very publication of this paper, if promptly made use of by the Committee on Membership in the respective states, ought to get the Association enough members to pay the expense of issuing it.

Mr. Louis Schulze, of Baltimore, said he was glad to report from the Conference of Boards of Pharmacy that steps were being taken along this line. He was sorry that California was not represented at the Conference. The committee report there covered all the points raised by Mr. Oldberg, even to the establishing of educational requirements. The idea was to gradually, year by year, raise the standard of educational requirements, until high school graduation should be a pre-requisite to graduation from a college of pharmacy.

Mr. Oldberg suggested that he did not think the reports were exactly along the same line, as this report of the committee did not set any specific requirement as to education, whereas the Conference of Faculties did make such requirements.

The motion of Mr. Mayo was then put to a vote and carried.

Mr. Oldberg said that since the session had taken this action, he believed that the request of the Association should be accompanied with the additional request that the editor of the *Bulletin* be added to the committee as *ex-officio* member. This motion was seconded by Mr. Eberle and carried.

The Chair stated that Mr. Kaemmerer, of Columbus, Ohio, had kindly agreed to make an abstract of his paper on "The Harmful Effects of our Pharmacy Laws."

Mr. Kaemmerer then proceeded to present his paper in abstract, the full text thereof being as follows :

#### HARMFUL EFFECTS OF OUR PHARMACY LAWS.

WM. F. KAEMMERER, PH. G., COLUMBUS, OHIO.

Of what benefit, if any, have our pharmacy laws been to the retail druggists? The above is a question which we, at this time, might well ask ourselves. These laws have now been in force a sufficient length of time so that we ought to be able to tell definitely as to results.

Viewing things from back of the drug store counter, I would answer that our pharmacy laws have not benefited the retail druggist to any great extent, but that they have on the other hand done an infinite amount of harm.

Ostensibly, these laws were enacted for the protection of the public, but the real object was to benefit those who would engage in the business of retail druggist, either as proprietors or clerks. This benefit was to come through a decreased competition; the intention was to make it more difficult to start a new drug store. The status of the retail druggist was also going to be raised, the retail drug business was going to take on a truly professional character.

Today we find that none of these things have transpired. Through a seemingly studied policy by which certain sections of our pharmacy laws have been ignored, the public are without protection, competition has vastly increased and the status of the retail druggist never was as low as it is to-day.

The causes which are responsible for most of the harm are : Permitted violations of the pharmacy law, the character of board of pharmacy examinations, and the manner in which these examinations are conducted.

From the very beginning there seems to have been some kind of an agreement all along the line through which that part of our pharmacy law which was intended to prevent a drug store from being left in charge of an unqualified person during the absence of the responsible head, was not to be enforced. Proprietors do not want the law enforced, because to enforce it would mean the employment of more expensive help. Boards of

pharmacy generally do not seem to want to enforce the law if they can help it, and our pharmaceutical press has been strangely silent on this point.

Through this non-enforcement of the pharmacy law, competition has increased to such an extent that the business has become unprofitable. Pharmacists have found it necessary, in order to exist or make any money, to add and extend the numerous side lines to their business, some of which have only a remote bearing on pharmacy. In many instances, the importance of these side lines has completely overshadowed the drug department, and we find so-called drug stores where the drug end of the business is only a side issue, and is not regarded as of any great importance. In some of these stores, anything pertaining to prescription work is unwelcome. Some proprietors do not hesitate to tell you that they do not want any prescription trade. They are glad when they do not get any prescriptions. In many of these stores the drug department is poorly stocked and without the necessary utensils for compounding prescriptions, yet their main hold on the public is that they are supposed to be drug stores and to be doing a legitimate drug business. It has come to such a point that in order to engage in the retail drug business and make money, it is not necessary to know much about drugs. We see all about us people engaged in the retail drug business who know little or nothing about pharmacy. We even have it rubbed into us, as it were, by one proprietor in Chicago who has been very successful in a financial way, and who has said, "Thank God that I am not a druggist." Because it has become necessary to devote so much attention to these numerous side lines, the druggist has lost prestige with both the physician and the public. Our pharmacy laws are largely responsible for this state of affairs.

They have made it easy for almost any one to engage in the retail drug business. Just because a clerk has a certificate he thinks he must have a store of his own and he is usually encouraged in this. Before we had any pharmacy laws, a clerk would hesitate a long time before assuming such a responsibility. Now, because a clerk has a certificate which gives him a legal right to conduct a drug store he assumes also that he has the moral right although we all know very well that such is not the case. If that section of the law referred to in the beginning would be strictly enforced, it would cause a clerk or anybody else to think about six or seven times before going into the retail drug business for himself.

Why can't this section of the law be enforced? Other laws are enforced. Laws against burglary and arson are enforced without any trouble. We are told that the reason this section of the law is not enforced is because of a lack of funds. It does not require a very large fund to enforce other sections of the law, that section, for instance, which says that no one can own a drug store unless he is a registered pharmacist himself or employs a registered pharmacist. Lack of funds is not the true reason for the non-enforcement of the law. The enforcement of the pharmacy law rests



entirely with the druggists themselves. If they do not want the law enforced it will not be enforced no matter how large a fund the Board of Pharmacy has at its disposal. As long as the law is not enforced we are not acting honestly with the public who are led to believe that they are receiving ample protection, whereas the opposite is very often the case. We have proprietors who are pharmaceutically blind, and who will engage anyone who will work at a cheap price ; when they buy drugs and chemicals, it is price before quality.

There are those who while admitting that the law is not enforced, that great injustice is done thereby, and that the public is not protected, still maintain that our pharmacy laws serve a very useful purpose on account of their educational value. They point with pride to the increase in the number of colleges of pharmacy, the costly equipment of some, the large number of graduates which they turn out every year, the prize winners and honor men. This on its face, looks reasonable.

Some of these colleges are not any credit to pharmacy. Their only excuse for existence is for the purpose of coaching students in their efforts to pass the Board of Pharmacy examinations. What becomes of all these graduates, prize winners and honor men? Few of them find their way back behind the drug store counter to stay. Many of them go on the road for some pharmaceutical house or find employment in the laboratory. Others just now are finding employment as food and drug inspectors. Back of the drug store counters, where their services are so greatly needed, is where we seldom find them. We cannot say that this has benefited the retail druggist. Thus far we have not been able to make any impression on the public regarding the necessary educational requirements of those who sell drugs and medicines. They are totally indifferent in the matter, and buy their drugs and medicines anywhere and of anybody. They do not look to see whether a store is observing the law or not, neither do they care.

There is one thing which our pharmacy laws have done, and which is not of any credit. They are responsible for the creation, back of the drug store counter, of an army of men who constantly demonstrate by their every move and act that they do not understand their business. They show this in their conversation, by the character of the work which they turn out, the preparations which they spoil, the things they do, and the things they do not do. Why don't they understand their business? They have certificates from the Board of Pharmacy. The reason they do not understand their business is because they never studied in the right way. Whatever studying they ever did, whether it was at the college of pharmacy, a correspondence course, or the dispensatories and quiz compends, was done with but one single object in view. That object was to pass the Board of Pharmacy examinations, to be able to answer the questions which they thought the Board of Pharmacy would be likely to ask. They did

not pursue their studies with the object of acquiring true knowledge which they could later put to practical use. After they passed their examinations the facts which they so laboriously committed to memory, they promptly forgot, and when the time comes to put these facts to practical use they are unable to do so, because they did not study them for that purpose. They do not study any more because they feel that they have complied with the requirements of the law and have worked hard enough to get through the examinations. They are through with studying.

The saddest part of it is that they do not realize their unfitness for the position which they hold. If you even so much as hint that they are incompetent, they will feel very much hurt and insulted.

To a certain extent our colleges and the numerous correspondence courses are also somewhat at fault here. In the past, in their efforts to obtain students, some colleges have dwelt more on their ability to have the student passed by the Board of Pharmacy than on the quality of the instruction which they gave. To the prospective student, too often, the appeal has been very much like this: "Come to us and take our course and we will get you 'passed' by the Board of Pharmacy, so that you can have that much-desired certificate and may start in business for yourself in the shortest possible time."

Perhaps it was not intended to convey such an impression; it is nevertheless a fact that a large percentage of students do take their college course with this object in view. One professor told me that seventy-five per cent. of his students were of that class.

Board of Pharmacy examinations, as given in the past, have been but a poor test as to the candidate's fitness to receive a certificate to practice pharmacy. We have had clerks who could not find anything to do although there were piles of work all around them. They could not locate anything; they would sell an article to-day, and a few days later when they had a call for the same thing they would not know where to look for it. Some have come to us who had never seen a pill machine or suppository mould; they would make a batch of pills and they would be of all sizes and shapes. They would get stuck on prescriptions for percentage solutions or others involving nothing more than a simple problem in arithmetic. Others would not know how to hold a graduate or pestle; would not know how to use a prescription balance and give it proper care. They would not know much about prices. For a prescription calling for two drachms of protargol and four ounces of water they would charge forty-five cents, because it was a four-ounce solution; one calling for an ounce of resin cerate they would charge fifty cents, because they thought the patient did not know what it was. Again, others would not know anything about solubilities or incompatibilities. They would start to fill a prescription the same as they would fill an order for merchandise; begin with the top article and continue on down until the last one. Where a large mortar is required they will use a small one or try to do without one.

One of our clerks asked, "Shall I register the sale of saltpetre the same as we do other poisons?" Another one knew nothing about doses; he spent fifteen minutes looking for half-grain strychnine pills, and he did the same thing when I had a friend ask for one dozen half-grain gelatin-coated arsenic pills. I finally had to tell him that we were just out and that we would have more of them to-morrow. Another clerk could not distinguish between white wax, spermaceti and paraffin. In preparing solution of citrate of magnesia, another one became frightened at the reaction between the magnesium carbonate and citric acid; holding the stirring-rod at arm's length he called to me with an expression of surprise and alarm. "Oh! look at it; look at it!" he cried, just as if he expected every minute that there would be an explosion.

A test-tube, to one of our clerks, seemed to be a wonderful invention; evidently he had never used one before; he was working on the following prescription:

Sulphate of strychnine .....	1 grain.
Tincture of cudbear .....	1 fluidrachm.
Water, to make .....	4 fluidounces.

Directions: Teaspoonful four times daily.

I saw him fooling around with a mortar and noticed that the crystals seemed to float on the surface of the water. I at once judged from this that he had used the alkaloid instead of the sulphate but I said nothing on this point. I saw that he was not making any headway, so I advised him to try it over again and warm in a test tube with some of the water. He did this and still there was no solution. I then called attention to his error, that he was using the alkaloid in place of the sulphate which the prescription called for. I had him try it again, this time, of course, using the sulphate. There was no trouble; warming the salt with some of the water in a test tube, solution took place at once. This test tube ever afterwards became this clerk's best friend, he would use it on all occasions; it made no difference what he had to deal with, whether it was atropine sulphate or morphine sulphate, he would use a test tube just the same.

The following prescription was put up as an ordinary mixture.

Balsam Copaiba .....	½ fluidounce
Comp. Tinct. Lavender .....	
Spirit of Nitre, of each .....	½ fluidounce
Mucilage of Gum Arabic .....	
Syrup, of each .....	1 fluidounce
Water, to make .....	6 fluidounces

Mix.

Of course, this was promptly brought back as not being correct. We asked the clerk why he did not make an emulsion. He calmly answered, "because it did not say anything about an emulsion on the prescription."

Extract of belladonna..... 1 grain.  
 Make into twenty pills.

This prescription proved a stumbling block for one clerk. How is anybody going to make twenty pills out of one grain of soft extract? We suggested that he use twenty grains of powdered licorice root to give sufficient bulk, and a little honey to help form the mass. He surprised us by stating that he didn't know about using honey but it certainly would not be permissible to use powdered licorice root on account of its cathartic properties.

I could give you a large number of examples like the above, but I think these are sufficient to demonstrate the point that I wish to make. These errors, or whatever you wish to call them, were all of them made by registered pharmacists, some of whom were college graduates. For the most part they were not the result of carelessness or oversight; these clerks just simply did not know.

I am not the only one who has had this kind of experience with clerks; others have experienced the same difficulty. It is just such things as these that cause us sometimes to ask, what kind of pharmacy do they teach at our colleges and in what do our Boards of Pharmacy examine candidates? Is it any wonder we sometimes hear a druggist say that he would rather not have a registered clerk or a college graduate in his store?

It might be argued that conditions in our store are unfavorable as the reason that we do not have better clerks. The contrary is true. We pay a little better salary and give better hours than others in our locality. We have a porter to do the cleaning and regular attendants at the soda fountain. What kind of clerks do you suppose they have in stores where the conditions are not so favorable; where the clerks must do the cleaning and wait on the soda trade?

Our State Board of Pharmacy is not to blame. The examinations of the Ohio board will compare favorably with those of other states. Ohio is fairly well supplied with colleges, so the fault is not there.

The fact is that our whole system under which we have been working is at fault. If we do not intend to enforce the pharmacy laws, then let us do away with them entirely. Place every one on an equal footing. Let every one stand on his own merits. Let us play fair. Do not punish a man because he takes the pharmacy law seriously and complies with its requirements.

The law should be impartially enforced, and I would suggest a change in the examinations. I merely offer this latter as a suggestion. I do not know how it would work in practice; perhaps some one can suggest something better. Have the examinations in two parts, theoretical and practical. The theoretical examination to be of such a character that none but a college graduate could possibly get through, and the practical examina-

tion to consume two or three days, the candidates to be required to prepare prescriptions and some U. S. P. and N. F. preparations. Exempt all graduates of a recognized college or school of pharmacy from the theoretical examination. Let the fact that they are college graduates be sufficient evidence that they have the required theoretical knowledge. All candidates, whether college graduates or not, should be required to take the practical examination.

I wish to call attention to another little army called into being by our pharmacy laws. It is the army of clerks with their eyes on the Board of Pharmacy examinations, and who are pursuing the short-cut route by the quiz-compend method. We have had such a clerk under observation for several years. He wants a certificate, and he is in a hurry to get it. He will go home of an evening and commit to memory a page or two of questions and answers. The next morning with things fresh in his mind he will fire a lot of questions at me to see if I know the correct answers. He will feel very much elated if at the time I am unable to answer some of them. He knows something that I didn't know. One morning he came at me with the question: "What form of iron is contained in tincture of iron?" I answered, "The chloride, of course." He said, "That's correct." Then he repeated, parrot-like, the answer from the book. "Iron is present in tincture of iron in the form of a chloride." I asked, "How do you know that is correct?" He answered, "Because you just said it yourself, and it stands that way in the book." I told him, "That's no reason; I may be wrong, and the printer may have made a mistake." Then I said, "Perhaps it is the nitrate; how do you know that it is not the nitrate?" This he didn't know. Then I asked him: "Admitting that chloride is correct, tell me which chloride it is: is it the ferrous chloride or the ferric chloride?" He didn't know anything about it. Of course, these were unfair questions to ask him, because the answers were not in the book. I asked him further, "How is tincture of iron prepared?" He could not answer, although he handled the article almost daily.

What form of iron is contained in tincture of iron? What a silly question to ask of any one who is supposed to know anything about pharmacy. About as much sense as there would be in asking a boy from the fifth grade of our public schools, how much is two times two? Six months from now if I ask this clerk his original question he will not be able to answer.

The Chair stated that the paper would take the usual course, without objection, and it was so ordered.

The Chair said the Section would now hear the report of the National Syllabus Committee, representing the Boards and Schools of Pharmacy, and called on Mr. George C. Diekman, of New York, to present the report.

Mr. Diekman said it was supposed by the Secretary of this Committee, Dr. Taylor, that it might be advisable to have this report presented to the

different Associations by different men, but after having heard the paper read by Dr. Willis G. Gregory, chairman, before the Conference of Pharmaceutical Faculties, and also before the National Association of Boards of Pharmacy, where in both cases it became necessary to make certain explanations, he felt that he himself could not do justice to the subject, and he would like to have Dr. Gregory present the report. The Chair stated that this was agreeable to the Section, and Dr. Gregory was asked to present the paper, which he did :

REPORT OF PROGRESS BY THE NATIONAL SYLLABUS COMMITTEE  
REPRESENTING THE BOARDS AND SCHOOLS OF THE  
UNITED STATES AND OUTLINING A MINIMUM  
COURSE AND SYLLABUS.

PREFACE.

It is fitting at the outset of an undertaking to attempt a clear exposition of the plan and scope of the work. From its inception the scope of this work has been the outlining of a minimum course of study and a syllabus for the guidance of pharmacy schools in their preparation of students for admission to the boards' licensing examinations. The plan unfolded in the historical sketch is an example of an American trait of character—the adaptation of present means to a definite end. Given a new and obscure law in New York State and the untried relation of several possibly conflicting interests, what happens? Conference leads to confidence, concession to inspiration, united effort to strong advance and local success to national influence.

*Syllabus.* The meaning of the word syllabus as applied to this undertaking needs to be clearly understood. The dictionaries make the word a synonym of compendium, abstract, epitome, brief. It is more than these. It is a concise statement of a scheme of lessons. The first suggestions of a syllabus for elementary and secondary schools in the State of New York appear in Regents actions as early as 1828. In 1880 it is a "summary of requirements." The syllabus of 1891 affects 504 secondary schools of the State with 50,000 students, passes through ten editions and establishes the five-year syllabus period. Let us paraphrase its introductory notes.

This pharmacy syllabus is prepared to indicate the general scope and character of the instruction to be given by the teacher and the work to be done by the student. By this means it is expected that adequate attention will be given to the essentials of each subject, that approved principles of teaching will be observed and that embarrassment to students in State Board examinations arising from defective instruction or the use of different text-books may be obviated. It is not designed, however, to interfere with such flexibility in courses of study and freedom in methods of instruction as ought to exist in pharmacy schools, but to indicate subjects of study, to present outlines of these subjects, experiments for the laboratory, definitions of standard requirements and topical analyses.

Examination questions are to be based upon the syllabus, but the instruction of the schools and the tests of the boards may fairly be expected to give recognition to important discoveries in pharmaceutical science and other significant changes. The plea that particular text-books are deficient will not be accepted in extenuation of inadequate knowledge. Special efforts will be made to state examination questions clearly and not to assume a degree of knowledge or skill in statement that may not reasonably be expected from pharmaceutical students. On the other hand, the schools should contribute their share toward the success of the examination set by the State boards by thoroughly covering the minimum course outlined and detailed by the syllabus.

A system of examinations adapted to the work of all the pharmacy schools of the United States must of necessity be somewhat different from one intended for the students of a single school. The personality of the teacher, the local environment and the textbook used, all tend to vary the work done in the different schools. As a result the exact course studied of any subject and the emphasis given to any part of it will not be precisely the same in any two pharmacy schools. This is as it should be, for were it not so the work would lack individuality and life. To provide for these conditions the pharmaceutical syllabus will give in general terms very full outlines of the subjects in which examinations are held. These outlines should, in fact, be so full that it will be quite impossible for any one class in the time allotted to study exhaustively all the topics mentioned and no one textbook could furnish the material for such exhaustive study. It is here that the alternative or group system of questions may give relief. If a question paper has been properly prepared and the student has been properly instructed, he should find on the paper questions that relate to matters which have not been taken up in detail in his study of the subject. If this is not the case, it is evidence either that the questions have not been properly distributed over the whole field, or that the instruction or study has been distributed over too much of the field. If teachers and students will take this attitude toward the examinations, all the hampering effects will disappear, and it will be, as it is intended to be, stimulating in the best sense.

The Committee confidently looks forward to the completion of an outline and syllabus that shall serve as a rational ground for instruction in pharmacy schools in the United States, and that shall afford permanent and scientific tests for admission to the practice of one of the most ancient and honorable branches of applied science.

*Historical Sketch.* The New York State laws of 1904, chapter 554, amended the laws of 1900, chapter 667, by inserting in section 194 (6) additional qualifications for licensed pharmacists in the words

"Until he shall have presented to the said Board the diploma of any pharmacy school, college or department of a university maintaining a two years course in pharmacy, and upon the request or with the approval of said Board registered by the Regents of the University of the State of New York as legally incorporated and as maintaining a proper pharmacy standard, provided such pharmacy school, college or department of a university shall require as a condition for entrance a satisfactory examination in subjects designated by said Regents of not less than 12 (15 new) Regents counts or an educational equivalent acceptable to said Regents."

Commenting upon this amendment the President of the Board says in the Report of 1905:

"The educational requirements of the amendments to the pharmacy laws, which became operative January 1, 1905, marked the greatest advance for the betterment of pharmacy since the enactment of the laws governing the practice of pharmacy in the four sections of the state previous to the year 1884, which laws required only age, experience and passing a simple examination before the various boards."

This amendment brought into closer relations the pharmacy schools of the State, the Board of Pharmacy and the Education Department. But whether the Board or the Regents should initiate the registration of the schools seemed obscure. The schools of the State differed materially in their courses of instruction and to a greater extent the schools of the United States. The Regents had never been called upon to determine what was the proper pharmacy standard for the schools, and the State Board had never attempted to outline or detail a syllabus covering its examinations. In the fall of 1904, before the law became operative, a conference of the various interests was held at Albany which resulted in the establishment by the Regents of a Council comprising the deans of the schools, and by the Board of an Ad Interim Committee (to act upon the

applications for registration), thus affording official relations between the Schools, the Board and the Department.

The result of this and subsequent conference with the experience in the administration of the amended law is found crystallized in the Regent's rules.

#### REGENTS REVISED RULES, CH. 10.

(Adopted March 12, 1908.)

*Sec. 405. Definitions.* *a.* An institution that though taking the name, in reality does work of a lower grade, may not be recognized as a college or university. Colleges of theology, law, education, medicine, dentistry, pharmacy, veterinary medicine, business and all similar professional and technical schools shall not be registered as colleges.

(*Note.*—This rule for registration does not affect the corporate title of an institution.)

*b.* An hour is the measure of the work prepared for a week's recitation, lecture or quiz in a higher institution. Two hours of practice or demonstration in a laboratory are considered equivalent to a recitation hour. A minimum year is 15 recitation hours for 40 weeks (600 hours) or the equivalent. 150 hours are the equivalent of 5 counts.

*Sec. 411. Schools of Pharmacy.* A school of pharmacy may be registered upon the request or with the approval of the State Board of Pharmacy as legally incorporated and as maintaining a proper pharmacy standard. It must have apparatus and equipment worth at least \$5,000, employ regularly not less than three professors giving instruction; give practical work in not less than three laboratory courses, including chemistry, pharmacy and materia medica; require for admission of students that they be at least 17 years old, of good moral character, and have a preliminary education of or equivalent to an approved one year academic course; shall maintain day sessions (the minimum requirements met prior to 6 P. M.); a two years course of instruction of at least 25 weeks, of 15 hours a week, in each year, with an interval of at least two months between the close of the first year and the opening of the second year of the courses; must advance the professional requirements to 1,100 recitation and laboratory hours as follows (provided that 100 hours laboratory work per annum may be credited to students employed in retail pharmacies through said year):

Session.	Hours.	Total.	Recitation	Laboratory.
1906-7 .....		750	320	430
1907-8 .....		900	385	515
1908-9 .....		1000	430	570
1909-10 .....		1100		

Schools without the State may be required to furnish lists of matriculates the same as New York schools and foreign schools applying for registration must meet the same requirements as the schools of the United States.

#### THE STATE SYLLABUS COMMITTEE.

The New York statute having specifically determined the general preliminary education requirement for admission to registered schools, and the Regents having adopted rules to govern incorporation and registration, it remained to determine what should be a proper pharmacy standard. Correspondence with the Council and with the representatives of certain national organizations revealed a hardship under which certain schools were suffering. The Department, on advice of the Ad Interim Committee, invited the Council and representatives of the American Conference of Pharmaceutical Faculties to a formal conference at the same time and place with the Board's semi-annual meeting. As a result of the conference and on the recommendation of the Council and of the Committee, the Board at its meeting held June 27, 1906, at Niagara Falls, voted unanimously:



"That the outlining of a course for the schools of pharmacy and the syllabus to govern both registration by the Education Department and examinations by the State Board of Pharmacy be referred to a Committee of Three representing the Board, the Council, and the Department. with power."

Dr. Rusby was appointed by the Council, Dr. Gregory by the Board, and Dr. Taylor by the Department.

This Committee, after several informal conferences, was organized at Indianapolis, September 3, 1906, by the election of Dr. Gregory as Chairman, and Dr. Taylor as Secretary. After full and careful consideration of the questions in all their bearings, the following items were voted:

*Enlarged Committee.* To give this work a national character the Committee should be enlarged, and an invitation should be extended to the National Association of State Boards of Pharmacy and the American Conference of Pharmaceutical Faculties, each to elect a representative of the Committee.

*Sub-Committees.* That the Syllabus Committee, after perfecting the general outline, should refer its details to four (later three) sub-committees for preparation, suggestion and report.

*Rules and Regulations.* That based on the rules adopted by the State Board and Education Department, the outline and syllabus conform so far as practicable to the present examination requirements of the State Board and curriculum of the schools.

*General Outline.* That the subjects now taught in the pharmacy schools, or examined by the State Board, be grouped in four classes (later three):

*Class 1.* Materia Medica: Therapeutics; toxicology; posology; physiology.

*Class 2.* Botany: Pharmacognosy, commercial, histologic; microscopy; bacteriology.

*Class 3.* Pharmacy: Theory; practice; dispensing; manufacturing; commercial; jurisprudence; pharmaceutic Latin; pharmaceutic arithmetic.

*Class 4.* Chemistry: general, inorganic, organic, analytic; pharmaceutic manufacturing; assaying; physics.

*Outline by Hours.* That as a tentative basis for the prosecution of the study, the twenty-five weeks of a term (total 500 hours) should be the minimum required for a year's work, and that 600 hours (100 hours of which may be allowed a year's experience in a drug store or a pharmacy) should be recommended. *Note* that the 100 hours' experience that is to be allowed toward the 600 hour year has to be outlined and provided for in this syllabus and should not be overlooked by the committee. *See* the graphic representation of this fact.

*Outline by Years.* That in outlining the course by years, the first year should prepare students for the examination as licensed druggist, or licensed assistant, the second year for licensed pharmacist, and the third year for doctor of pharmacy.

The annual reports of this Committee have received the unanimous approval of the Board which has borne its proportion of the expense, has continued the Committee with power and has published this report.

#### NATIONAL SYLLABUS COMMITTEE.

*National Association of State Boards of Pharmacy.* At a regular meeting of this Association, held at Indianapolis, September 5, 1906, the aims and objects of the Syllabus Committee and the bodies represented therein were presented. The idea of acting in conjunction with New York State was received with favor and the hope was expressed that the Committee might evolve a syllabus acceptable to all schools and boards of pharmacy.

Mr. William Bodemann was appointed to act as the representative of this body, which has borne its proportion of the expense, and Mr. Ernest Engstrom was elected his successor at the meeting of the Association in New York, September 19, 1907.

*American Conference of Pharmaceutical Faculties.* At a regular meeting of this Association held at Indianapolis, September 5, 1906, the Committee reporting on the president's address recommended the appointment of a member of the Conference to act on the Syllabus Committee. On formal request the chairman of the Committee who subsequently became the president of the Conference, consented to represent the Conference for the year and was elected its representative at a meeting held in New York, September, 1907. The Conference has borne its proportion of the expense.

*Section on Education and Legislation, A. Ph. A.* At a joint meeting of the Conference and Boards held at Indianapolis, September 6, 1906, it was voted that a syllabus of pharmacy examinations should be prepared, which will indicate the subjects to be included in the Board's examinations as well as in the course of instruction in the pharmacy schools with the view to the attainment of a reasonably uniform standard of minimum requirements which may be adopted by all boards and schools. The joint meeting of these with the Committee on Education, A. Ph. A. at its New York session adopted the Committee's report and ordered it printed.

*The Committee of Five.* This Committee, organized Thursday afternoon, September 6, 1906, with Dr. Gregory as president, and Dr. Taylor as secretary. The subjects outlined by the New York Committee were adopted as read except the subject of anatomy. The four (later three) subjects as outlined were to be referred to four (later three) sub-committees of five members each, comprising a chairman from the Committee of Five and four members named by the four chairmen and representing the schools and boards of New York State and the United States. After final discussion at the New York meeting this Committee became an Executive Committee to present all matters for discussion and for action to the larger committee.

*The Committee of Twenty-one.* The organization of this Committee was perfected and the members assigned to four (later three) sub-committees of five members each, in accord with the general outline, the secretary being relieved from Committee assignment.

*Materia Medica*—H. H. Rusby, New York; C. O. Bigelow, New York; F. P. Tutbill, New York; C. T. Heller, Minnesota; C. B. Lowe, Pennsylvania.

*Botany*.—J. H. Beal, Ohio; Charles B. Sears, New York; Ernest Wende, New York; C. Lewis Diehl, Kentucky; J. O. Schlotterbeck, Michigan.

*Pharmacy*.—W. G. Gregory, New York; Samuel A. Grove, New York; William C. Anderson, New York; Charles Gietner, Missouri; Oscar Oldberg, Illinois.

*Chemistry*.—William Bodemann, Illinois; George C. Diekman, New York; T. J. Bradley, New York; S. L. Hilton, District of Columbia; Julius A. Koch, Pennsylvania.

All the subjects found in the examination of State boards and in the curriculums of the pharmacy schools were presented to the Committee, and by process of elimination were narrowed down to an outline for a minimum course of study. Early in the work it became apparent from the wide discrepancy in the use of pharmaceutical terms, both in the dictionaries and in the announcements of the schools, that formal definitions as a working basis for the Committee were necessary. It also appeared that the four-fold division of the work was unsatisfactory. Moreover, a determination of the proportion of time to be given the several sub-divisions of the curriculum in a minimum two-year course could not be made intelligently. Through correspondence, a discussion of these various items continued until a regular meeting of the Committee was held September 3, 1907, at Hotel Astor, New York City. Sixteen of the twenty-one members were present, and after a full and exhaustive discussion of the definitions they were amended for tentative use by the Committee and were published in the pharmaceutical journals of the country, with a request for criticism, suggestions, corrections or emendations.

Formal reports were presented through the representatives to the National Association of State Boards, to the American Conference of Pharmaceutical Faculties and to the

Committee on Education and Legislation of the American Pharmaceutical Association at their meetings in New York, September, 1907.

*Reorganization, July, 1907.* As a result of prolonged discussion the Committee voted to reduce the four sub-committees to three, of seven members each, viz., (1) *materia medica*; (2) *pharmacy*; (3) *chemistry*, and the Chair appointed the members of the Committee to the respective positions now held by them as printed in this report. On formal motion, it was voted to require the assignment of hours to the various sub-divisions in detail.

*Recommendations of the Executive Committee.* The Executive Committee, after prolonged correspondence, decided that the Secretary should assemble in a connected whole all rules, definitions, principles and assignment of hours thus far established for the use of the Committee; and that the following items should be referred to the Committee for formal action.

In accord with these instructions the Secretary prepared this report and the Executive Committee, after personal revision in July, 1908, referred to the full Committee for suggestions, corrections, and ratification (1) the three principles, (2) the tentative outline of hours in detail, and (3) the distribution of the 1,000 hours of a minimum two-year course, as an outline for the syllabus, with the recommendation that the Committee rise and report progress.

By August 28, 1908, twenty of the Committee of Twenty-one had voted on the items submitted to them by the Executive Committee. There were 19 affirmative votes for the three principles; 16 affirmative votes for the tentative outline of hours in detail; 19 affirmative votes for the distribution of the one thousand hours of a two years' minimum course; and 20 affirmative votes that the Committee rise and report progress.

*Principles.* (1) The hours shall be, so far as possible, multiples of 1, 2, 3, 5, 20, and 25, providing for classes affording instruction to the junior or senior classes three days a week and for those affording instruction five days a week; providing for twenty periods a week (two days of seven hours and one of six) and for twenty-five hours a week (five days of five hours each); providing for years of twenty-five weeks or twenty-six, twenty-eight, twenty nine, etc.

(2) The syllabus shall be issued under revision for a certain definite time to be designated the First Syllabus Period. On the experience of the first syllabus period it shall be revised and become effective for a second syllabus period, etc.

(3) The minimum 1,000 hours of the course shall be strictly professional work.

#### *Detailed tentative assignment of hours.*

I. MATERIA MEDICA.	1st yr., 160.	2d yr., 140.	Total, 300.
Physiology .....	30	....	30
Botany. ....	45	....	45
Microscopy .....	40	....	40
Pharmacognosy .....	20	....	20
General facts and principles....	10	15	25
Toxicology-posology.....	15	20	35
Histological pharmacognosy .....	....	35	35
Pharmaco and therapy dynamics.....	....	35	35
Commercial pharmacognosy.....	....	35	35
II. CHEMISTRY.	1st yr., 200.	2d yr., 200.	Total, 400.
Elementary chemistry .....	25	....	25
Elementary physics .....	25	....	25
General inorganic .....	25	....	25
Pharmaceutical inorganic.....	25	organic 25	50

Qualitative .....	50	25	75
Manufacturing .....	50	25	75
General organic.....	....	25	25
Assaying.....	....	50	50
Quantitative .....	....	50	50

III. PHARMACY.	1st yr., 140.	2d yr., 160.	Total, 300.
Pharmaceutical arithmetic .....	20	....	20
Pharmaceutical Latin .....	20	....	20
Theory of pharmacy.....	25	....	25
Practice of pharmacy .....	25	40	65
Commercial pharmacy .....	25	25	50
Manufacturing pharmacy .....	25	40	65
Dispensing pharmacy.....	....	50	50
Pharmaceutical jurisprudence .....	....	5	5

*A minimum two-year course by hours.*

BRANCHES.	1st yr.	2d yr.	Total.
I. Materia medica.....	160	140	300
II. Chemistry .....	200	200	400
III. Pharmacy .....	140	160	300
Total.....	500	500	1000

*General outline recommended by the Committee.* The National Syllabus Committee representing boards and colleges of pharmacy respectfully recommends for adoption this general outline of subjects, hours and years as a tentative minimum course of study for the guidance of pharmacy schools in the preparation of students for admission to the examinations of the State boards of pharmacy during the first syllabus period (August 1, 1910, to July 31, 1915).

*Definitions.* The wide discrepancy in the use of pharmaceutical terms by the dictionaries, in the announcements of schools and in the examinations set by State boards makes formal definitions necessary. The definitions used in this outline have received most careful consideration from experts and by the committee. They are submitted for careful revision, that from the study may spring proper definitions and a logical modern vocabulary for use in the syllabus.

*Hours and Years.* The twenty-five weeks of a year (total, 500 hours) are the minimum required for a year's work, and 600 hours are recommended for 100 (laboratory) hours of which a year's experience in a drug store or a pharmacy may be allowed. In outlining the course by years, it is contemplated that the first year shall prepare students for the examinations as licensed druggists, or licensed assistants, and the second year as licensed pharmacists.

*General Terms.* The principle on which the definitions have been chosen is an old one.

"In words as fashions the same rule will hold,  
Alike fantastic if too new or old.  
Be not the first by whom the new is tried,  
Nor yet the last to lay the old aside."

For clearness and precision the general terms are first defined.

*a. College and School.* The term college includes universities and other institutions of higher instruction, authorized to confer degrees in arts and science. Professional and technical higher institutions are uniformly called schools, whatever their corporate title, hence the word school as used in this work refers uniformly to colleges or schools of

pharmacy, or to the pharmacy departments of universities. (Of course this use of the word does not affect the corporate title of the institution.)

*b. Pharmacology.* The sum of scientific knowledge concerning drugs and medicines; their nature, preparation, administration and effect; including pharmacognosy, pharmacy, pharmaco-dynamics and therapy-dynamics.

*c. Drugs.* All substances used as medicines or in the preparation of medicines. Drugs that have not been changed by manufacture except by dessication or comminution are crude drugs.

*d. Medicine.* A drug or preparation of drugs in suitable form for use as a curative or remedial substance.

*e. Materia medica.* 160 hours, first year; 140 hours, second year; total, 300 hours. Materia medica is the branch of pharmacology that treats of the physical, physiological and therapeutical properties of medicine.

*f. Chemistry.* 200 hours, first year; 200 hours, second year; total, 400 hours. Chemistry is the science of the composition of material things and the art of determining such composition. As a branch of pharmacology it treats of the chemical materials of medicine.

*g. Pharmacy.* 140 hours, first year; 160 hours, second year; total 300 hours. Pharmacy as a branch of pharmacology is the science and art of preparing, preserving, compounding and dispensing medicine.

#### *First Year.*

*Physiology.* 30 hours. Physiology treats of the organic functions in a state of health.

*Botany.* 45 hours. Botany treats of the structure, growth and classification of plants.

*Microscopy.* 40 hours. The art of examining objects with a microscope.

*Pharmacognosy.* 20 hours. Pharmacognosy treats of the identification and selection of drugs.

*Materia medica.* General facts and principles. 10 hours. In the introduction the general facts and principles of materia medica are brought out and instruction given to cover the requirements of examinations for licensed druggists. This theoretical instruction is co-ordinated with the practical under Pharmacognosy.

*Toxicology-Posology.* 15 hours. Toxicology treats of poisons, their recognition, effects and antidotes. Posology treats of the doses of medicines.

*Elementary chemistry.* 25 hours. General chemistry treats of the principles of chemistry and their application. This subject gives a comprehensive and connected view of the more important facts and laws of elementary chemistry.

*Elementary physics.* 25 hours. Physics is the science of the properties and forces of matter.

*General inorganic chemistry.* 25 hours. Inorganic chemistry treats of those substances that do not contain carbon in a combustible form.

*Pharmaceutical chemistry.* 25 hours. Pharmaceutical chemistry treats of the chemistry of remedial and curative substances.

*Qualitative inorganic chemistry.* 50 hours. Qualitative chemistry determines the chemical constituents of a substance.

*Manufacturing chemistry.* 50 hours. The production of chemical substances.

*Pharmaceutical arithmetic.* 20 hours. The arithmetic pertaining to the science and art of pharmacy.

*Pharmaceutical Latin.* 20 hours. The Latin pertaining to the science and art of pharmacy.

*Theory of pharmacy.* 25 hours. The exposition of the principles upon which pharmacy operations are based.

*Practice of pharmacy.* 25 hours. Systematic exercises in general pharmaceutical operations.

*Commercial pharmacy.* 25 hours. Trade or commerce in pharmaceutical products, including business practice.

*Manufacturing pharmacy.* 25 hours. The preparation of pharmaceutical substances.

*Second Year.*

*Materia Medica.* 15 hours. A review of the general principles of materia medica.

*Toxicology-Poology.* 20 hours. Concluded from the first year.

*Histological pharmacognosy.* 35 hours. Histological pharmacognosy treats of the recognition, identification and selection of drugs by well-known methods and appliances, including the microscope.

*Pharmaco and therapy dynamics.* 35 hours. Pharmaco-dynamics treats of the action of medicines on healthy organs. Therapy-dynamics treats of the action of medicines on diseased organs.

*Commercial pharmacognosy.* 35 hours. Commercial pharmacognosy treats of the trade and commerce in drugs.

*Pharmaceutical organic chemistry.* 25 hours. Practical work in the laboratories co-ordinated with the theoretical work of organic chemistry.

*Qualitative chemistry.* 25 hours. Continued from the first year.

*Manufacturing chemistry.* 25 hours. Continued from the first year.

*General organic chemistry.* 25 hours. Organic chemistry treats of compounds containing carbon in a combustible form.

*Assaying.* 50 hours. Assaying determines the amounts of the valuable constituents of pharmaceutical substances.

*General quantitative chemistry.* 50 hours. Quantitative chemistry determines the amounts of the constituents of a substance.

*Practice of pharmacy.* 40 hours. Continued from the first year.

*Commercial pharmacy.* 25 hours. Continued from the first year.

*Manufacturing pharmacy.* 40 hours. Continued from the first year.

*Dispensing pharmacy.* 50 hours. The extempore preparation or compounding of medicine.

*Pharmaceutical jurisprudence.* 5 hours. The relations of law and pharmacy to each other.

FINANCIAL STATEMENT.

During the first year of the Committee's activity, September, 1906-1907, sixty dollars was expended for postage and stationery. This expense was met by twenty-dollar contributions each from the New York State Board of Pharmacy, National Association of State Boards, and the American Conference of Pharmaceutical Faculties.

HENRY L. TAYLOR, *Secretary.*

The Chair called for action on the report just read, and on motion of Mr. Kraemer it was received, to take the usual course.

The Chair stated that this completed the general work of the Section, unless some of the members had some special subject of discussion to bring up. Nothing was suggested, however, and the Chair said the next business would be the installation of officers of the Section for the ensuing year. He said the officers elected were Messrs. Joseph W. England, of Philadelphia, Chairman; Charles H. LaWall, of Philadelphia, Secretary; and C. Osseward, of Seattle; Julius A. Koch, of Pittsburg; and L. R. A. Suppan, of St. Louis, Associates on the Committee. The Chair stated that, without objection, it would be considered that these officers and members were duly installed, without going through the ceremony of installation, and it was so ordered.

On motion, the Section then adjourned.

# MINUTES

## OF THE

### SECTION ON SCIENTIFIC PAPERS.

---

FIRST SESSION—THURSDAY MORNING, SEPTEMBER 10, 1908.

The first session of the Section on Scientific Papers was called to order at 10:30 a. m. by Secretary Charles E. Vanderkleed, of Philadelphia, who stated that in view of the fact that he was the only member of the Committee on Scientific Papers present, it would be necessary to elect a Secretary *pro tem*, and he would be glad if some one would nominate Mr. M. I. Wilbert, of Philadelphia, for that position. This motion was seconded by Mr. Kennedy and Mr. Hays, who moved to elect Mr. Wilbert by a unanimous rising vote, and this program was carried out. Mr. Wilbert assumed the duties of the position of Secretary.

Acting Chairman Vanderkleed said it had become almost a habit for him to announce the absence of the Chairman of this Section; that he was obliged to do this last year at the New York City meeting, and this year he regretted to have to announce that Chairman Virgil Coblentz was unable to be present. It was his intention to come, he said, and he had already started for the meeting, when a serious trouble with his eyes became so pronounced that he was obliged to stop off for treatment. He had sent a copy of his address, however, and asked Mr. Vanderkleed to express his regret to the Section at his inability to be present.

Mr. Vanderkleed then presented the Chairman's address as follows:

#### OUR PHARMACOPŒIAL RUBRICS.

BY VIRGIL COBLENTZ, PH. D.

The most characteristic innovation in the last revision of the U. S. Pharmacopœia was the "Purity Rubric." This represents a concise statement of the degree of purity expected of the various chemicals; that is, how much of the true substance must be present. The different tests of the text are intended to detect such deleterious impurities as usually occur in the chemicals in question, harmless by-products being ignored and tacitly permitted to be present to the extent allowed by the rubric. Without

this, it would be impossible to fix the permissible limit of foreign salts unless an assay process were given under each chemical. The absence of assay methods whereby this purity rubric may be determined has been the subject of general criticism.

It has been the policy of previous revisions to restrict analytical methods to those within the field of volumetric analysis, because of their simplicity and conciseness of description, so essential to pharmacopœial requirements. Unfortunately these methods do not suffice for the majority of our official chemicals.

The introduction of quantitative methods carries with it serious difficulties, as for example, the selection of a method that would meet with the general approval of chemists and withstand the criticisms of experts before our Courts. Those of us who have had any experience with analytic methods must realize the difficulties to be encountered in settling such questions to the satisfaction of all, with such a great variety of problems as are presented in our Pharmacopœia. Another more difficult question, is the adaptation of the usual long descriptions with precautions, so essential in carrying out quantitative analytic processes, to the very limited space of our pharmacopœial text. It has also been argued that tests limiting the quantities of the innocuous impurities could replace the rubric. This is quite true, and might be carried out were it possible to foresee new sources of supply for the raw materials, since our manufacturers are constantly improving their methods and selecting other sources of supply which introduce new phases into the question of tests. It is scarcely necessary for me in this connection to call your attention to the tremendous advances made in recent years in the field of electro-chemistry, the application of which affects many of our most important medicinal chemicals. Our old tests soon become antiquated and necessarily cannot cover such new problems that arise during the interval between revisions. Just such variable questions are covered by our rubric.

The fixing of these standards was a question that demanded considerable care in order to avoid imposing too rigorous restrictions upon our manufacturers, thereby enhancing the cost of our chemicals on the one hand, while on the other it was necessary to maintain the high standard necessary for medicinals. This was accomplished through an examination and careful comparison of the sources of our market supply. While one manufacturer excelled in one line, others excelled in another. There being no reason why all could not comply with the highest standards, these were adopted with general approval. It being about three years now since the Pharmacopœia has been in force and our manufacturers have had the opportunity of replacing old stock, it was considered to be of interest to determine to what extent our Rubrics are complied with. It is not necessary to examine all of our official chemicals but only such as had shown considerable variation in quality in previous years. The samples examined



were obtained recently from our three largest manufacturing houses, namely: Messrs. Merck & Co., Mallinckrodt Chemical Works, and Powers, Weightman, Rosengarten Co. One set of each of these marked "D" was obtained direct, while the others marked "M" were bought through jobbers. A fact worthy of mention and to the credit of our manufacturers, is that in the majority of instances the samples purchased in the open market were of better quality (higher Rubric) than those furnished direct. In addition to these samples, a number of miscellaneous origin as well as some that were examined in 1903 have been included.

A total of 201 samples (aside from those of miscellaneous origin) were examined. These represent 42 different chemicals. Of this total, 18, or about 9 per cent. were below standard. Of the 14 samples of known miscellaneous origin, only two were below standard. This does not include a large number of unknown origin purchased at various times at retail. In addition, the analyses of samples examined some five or six years ago had been omitted from the above summary, but included in the table for purposes of comparison. The following chemicals failed to fully comply with their Rubrics.

Ammonium Carbonate—two samples (one manufacturer).

Sodium Acid Sulphite—three samples (two manufacturers).

Sodium Salicylate—two samples (one manufacturer).

Rochelle Salt—two samples (one manufacturer).

Zinc Valerate—two samples (two manufacturers).

Manganese Dioxide—two samples (one manufacturer).

When we consider the unsatisfactory character of most of these salts, as regards the preservation of some, the difficulties encountered in attaining the standard in others, and that these represent, in most instances, only one or two samples, the showing does great credit to our manufacturers and demonstrates that material progress has been made since our last revision.

A further examination of these samples will be made in order to ascertain to what extent they conform to our special tests for purity.

	Rubric.	Merck.	Mallinckrodt.	P. W. R.	
Ammonium Bromide.....	D 0.3 Gm.= N AgNO <sub>3</sub> 31.6 Cc. 10 not over	30.90	30.80	30.70	
Ammonium Carbonate .....	M ..... 97% Carbonates	30.95	31.00	30.90	
Ammonium Iodide.....	D ..... 0.5 Gm.= N AgNO <sub>3</sub> 33.72 Cc.	97.16 34.80	98.21 34.95	94.02 34.75	
Bismuth Citrate, '03 .....	M ..... 56-58% Bi <sub>2</sub> O <sub>3</sub>	34.80	34.85	34.80	Squibb
Bismuth Gallate.....	D ..... 52-57% Bi <sub>2</sub> O <sub>3</sub>	57.9	57.5	57.3	53.54
Bismuth Salicylate.....	M ..... 62-66% Bi <sub>2</sub> O <sub>3</sub>	52.88	52.11	53.76	
Free Salicylic Acid, 0.3-0.5 % .....	D ..... 90% Bi <sub>2</sub> O <sub>3</sub>	52.8	52.6	53.5	
Bismuth Subcarbonate, '03.....	M ..... 80% Bi <sub>2</sub> O <sub>3</sub>	64.3	64.75	65.	63.42
Bismuth Subnitrate .....	M ..... 46-50% Bi <sub>2</sub> O <sub>3</sub>	64.8	63.74	67.4	
Bismuth and Ammon. Cit, '03.....	M .....	90.7	91.1	91.1	49.5 Pfizer
Calcium Bromide.....	D 97% CaBr <sub>2</sub>	80.	80.	80.	51.45 McK. & R.
Miscellaneous Origin, '03.....	..... CaBr <sub>2</sub> ..... .....	CaBr <sub>2</sub> 77.86+ CaCl <sub>2</sub> 6.04	CaBr <sub>2</sub> 79.6+ CaCl <sub>2</sub> 3.81	CaBr <sub>2</sub> 81.7+ CaCl <sub>2</sub> 3.82	
Calx Sulphurata.....	D 55% CaS	+55	+55	+55	
Ferric Chloride, dry.....	M ..... 22% Fe	+60 22.12	..... 22.31	+58 22.03	
Ferrous Sulphate, cryst. ....	..... 99.5% FeSO <sub>4</sub> .7H <sub>2</sub> O	22.05	22.51	22.07	U. S. Steel Wire Co.
Gold and Sodium Chloride .....	D 30% Au	99.9	99.8	99.9	99.8
Iron, reduced .....	D 90% Fe	.....	.....	29.8 to 30.1	
" .....	M .....	93.07	95.69	92.29	Roesler & Henslacher
" .....	M .....	93.33	96.20	92.36	92.13
Lead Oxide .....	M 96% PbO	99.5	99.8	98.8	
" .....	D .....	99.3	99.5	98.6	

	Rubric.	Merck.	Mallinckrodt.	P. W. R.	
Lithium Carbonate.....	D	98.93	98.62	99.12	
Lithium Citrate, dry .....	M	98.62	99.95	99.3	
Magnesium Carbonate.....	D	98.63	98.67	98.52	
Miscellaneous, '03 .....	M	98.72	98.65	98.82	
Magnesium Oxide .....	D	40-97	40.6-98.95	41-98.35	
	M	40-96.5	40.86 to 98.8	41.75-98.5	
		97.54	98.10	97.66	
		98.82	....	97.33	
Foreign soluble matter, '03.....		K. & M. 0.044	W. H. S. = 0.004	P. W. R. = 0.025	Henry = 0.0045
Manganese Dioxide .....	D	84.02	77.4	89.4	
Potassium Acetate .....	M	84.2	77.	90.	
5 miscellaneous samples .....	D	99.53	98.93	99.5	94.65 to 99.88
Potassium Acetate '03 .....	M	....	....	....	
Potassium Bromide.....	D	99.21	99.2	99.1	
	M	99.9	99.78	99.9	
		25.55	25.30	25.15	
24.6 to 25.85 Cc. 1% AgNO <sub>3</sub> = 0.3 Gm.	D	25.25	25.20	25.45	
Miscellaneous samples .....	M	....	....	....	95.5 to 97
Potassium Hydroxide .....	D	86.	85.8	85.30	Commercial
		85.8	85.87	87.65	70.87-89.5
..... '03 .....	M	88.5	89.20	82.6 to 87.14	
Potassium Iodide .....	M	99.95	99.54	99.43	
Potassium Sodium Tartrate .....	D	99.71	99.3	99.68	
	M	100.	99.5	100.	
Sodium Acetate .....	D	100.	98.06	100.	
Sodium Acetate '03.....	M	....	....	....	Commercial
Sodium Bisulphite .....	D	88.30	60 = 98.88	60 = 99.88	99.75-99.88
	M	92.20	83.42	93.74	
	D	....	82.44	96.88	
	M	....	....	....	

	Rubric.	Merck.	Mallinckrodt.	P. W. B.	
Sodium Sulphite.....	D	97.8	95.6	95.2	W. H. S.
".....	M	97.6	95.4	95.7	88.3
"..... '03 .....	M	....	....	94.96	
Sodium Bromide .....	D	29.4	29.4	29.35	
Sodium Hydroxide .....	M	29.35	29.35	29.40	
".....	D	98.5	92.9	92.	Commercial
".....	M	98.4	92.75	92.24	86.4-89.5
					87.5
Sodium Iodide .....	D	33.5	33.9	33.6	
Sodium Nitrite.....	M	33.4	34.0	33.0	
".....	D	98.	96.85	95.9	
Sodium Phosphate.....	M	97.5	96.5	96.2	
Arsenic Content .....	D	U. S. P.	U. S. P.	U. S. P.	in '03
		....			
Sodium Salicylate .....	D	100.	99.05	100.	1 As <sub>2</sub> O <sub>3</sub> in 40,000
".....	M	100.	99.15	100.	1 As <sub>2</sub> O <sub>3</sub> in 60,000
Strontium Iodide .....	D	22.4	22.90	22.95	
Zinc Bromide .....	M	22.25	23.0	23.05	
".....	D	99.07	98.44	98.21	
Zinc Oxide .....	M	99.05	99.15	97.80	
".....	D	99.53	99.35	99.3	
Zinc Stearate .....	M	99.26	99.97	99.2	McK. & R.
".....	D	14.6	....	14.5	15.8-15.56
".....	M	14.75	14.66	14.76	15.4
Zinc Valerate .....	D	28.01	24.8	28.93	
"..... '03 .....	M	28.95	25.1	29.	
".....	M	....	22.5	22.2	

The Chair called for action on the address just read, and Mr. Mayo moved that it be received, to take the usual course, by referring to the Committee on Publication, as there was no recommendation embodied in report. This motion was seconded by Mr. Forbes, and carried.

The Chair next called for the report of the Committee on Ebert Prize, and Mr. Charles E. Caspari read the report as follows :

#### REPORT OF COMMITTEE ON EBERT PRIZE.

Your committee begs to report that in its opinion the Ebert prize should be awarded to A. B. Stevens and L. E. Warren for their paper on "Poison Sumac."

CHARLES E. CASPARI,  
HENRY KRAEMER.

The Chair called for action on the report of the Committee just made, and Mr. Ladish, of Chicago, moved to receive, and that the recommendation made be concurred in. This motion was seconded and carried.

The Chair called for report of the Committee on Drug Adulterations, E. L. Patch, Chairman. Mr. Kebler, of the committee, explained that Mr. Patch was unable to be present, but had forwarded the report that he had gotten together, with the request that Mr. Kebler present it before the Section. Mr. Kebler said he had been unable to forward his own report in time to be incorporated in the main report, but had it with him, as a supplement to the report of the committee, and said he would first present the original report sent by Mr. Patch in rather full abstract, and then present his own report. Thereupon he made an oral abstract of the original report, and his own supplemental report, the full text of said papers being as follows :

#### REPORT OF COMMITTEE ON DRUG MARKET FOR THE YEAR ENDING AUGUST 1, 1908.

The general sentiment appears to be that the condition of the market has greatly improved. Surgeon Gen. Wyman reports a vast improvement and other observers agree with him. There have been comparatively few reports of adulterations in the pharmaceutical press.

Some State Board reports have a bad showing. One reports 336 out of 1226 samples adulterated or deficient in strength. Sixty of these were alcohol, ranging in strength from 44.43 per cent. to 87.61 per cent., while a large number were preparations containing cocaine, the sale of which had been prohibited.

No doubt deliberate sophistication is practiced to some extent, as indicated by the sale of fictitious balsam of Peru and volatile oils. We have found but one dealer offering oil of sandal, W. I., as a true material product distilled from *Amyris balsamifera*. Other houses offered it as a fictitious product.

We are informed that additions have been made to Methyl Salicylate to give it the bead and rotary power of the true oil, and that the best analysts cannot determine their presence. We have known a sample that was not supposed to be oil of wintergreen, pronounced such by analysts of long experience. One said it answered all tests of the U. S. P., but he was suspicious of it. Probably we can all be suspicious of every sample. In view of the trade conditions surrounding this product, the statements of the

variations in therapeutic action of methyl salicylate, oil of birch and oil of wintergreen is most interesting and amusing reading. It would seem to be incumbent on the pharmacopœial committee to ascertain reliable tests for these products, or drop all but methyl salicylate from the official list.

When 1 Cc. of methyl salicylate is treated with 10 Cc. of KOH solution as directed in the U. S. P., the odor is destroyed. In the case of oil of birch or oil of wintergreen, while the gaultheria odor is destroyed, a characteristic different odor remains. Sometimes in this mixture the odor of additions can be distinguished.

Oil of Macassar Root is said to be freely mixed with oil of Sandal, E. I. Dementholized Oil of Peppermint is said to be largely used for extending Oil of Spearmint.

African Balsam is said to be mixed with certain lots of Central American Copaiba to the amount of 50 per cent. without being identified or suspected.

We have been informed that many fictitious oils have been developed to meet the pharmacopœial requirements, as the standards seem to refer to ordinary lots or are based upon examination of particular samples, and do not take into account the great variation in nature's handiwork. It is stated that oil of rosemary distilled from plants in a certain locality was left-rotary one season and right-rotary the next.

The great range in the character of drugs is illustrated by the work of F. H. Carr and W. C. Reynolds, whose results were printed in the Pharm. Journal.

Aloes Curaçao, aloin contents from 12.6 per cent. to 27.9 per cent.

Belladonna root—alkaloidal contents 0.29 per cent. to 0.55 per cent.

Belladonna leaf—alkaloidal contents 0.23 per cent. to 1.08 per cent.

Broom tops—alkaloidal contents 0.07 per cent. to 1.06 per cent.

Calabar bean—alkaloidal contents 0.04 per cent. to 0.27 per cent.

Coca—alkaloidal contents 0.18 per cent. to 0.79 per cent.

Hydrastis—hydrastine 0.14 per cent. to 3.17 per cent.

berberine—2.3 per cent. to 5.8 per cent.

Hyoscyamus—0.06 per cent. to 0.21 per cent.

Jalap—resin contents 5.1 per cent. to 15.8 per cent.

Mandrake—resin contents 3.8 per cent. to 6.65 per cent.

The table gives further results, but does not note that the variation in extractive is quite as marked and where fluidextracts and tinctures are adjusted to alkaloidal strength the variation is sufficient in extractive to cause marked change in color and to alter the alcohol strength of the product.

Where a drug is 25 per cent. weak in alkaloid and double the usual extractive contents and another sample is 25 per cent. strong in alkaloid and has half the amount of extractive, the variation in the fluidextracts is very marked. It has been pointed out that we can no longer define fluidextracts as representing in all cases 1 Gm. of drug in 1 Cc. of product, but in some cases as made to contain a standard quantity of the recognized active constituent by a standard process of assay. The variation in alkaloidal and extractive contents of drugs is paralleled by variation in other constituents and we have right and left rotary oil of turpentine and some abnormal variations in true products that cause the dealer annoyance.

It is stated that much oil of lemon is used in extending oil of bergamot. Also that mixtures of oil pennyroyal and lemon have been used to extend oil of spearmint.

All reports of the Committee were not received by the Chairman in time for tabulation, but we append the following:

EDGAR L. PATCH, *Chairman.*

*Acid Acetic.*

Two lots gave trace of heavy metals. W. L. Scoville.

*Acid Benzoic.*

Some lots have objectionable odor. W. L. Scoville.

*Acid Boric, Purified.*

Average assay, 99.69 per cent. One lot had excess of sulphate. E. L. Patch.

*Acid Hypophosphorous, 50 per cent.*

Calcium oxalate present and trace of iron. Assay from 48 per cent. to 49.5 per cent.

E. L. Patch.

*Acid Lactic.*

72.3 per cent. to 89.2 per cent. W. L. Scoville.

*Acid Stearic.*

Melting-point, 55° to 58° C. W. L. Scoville.

*Acid Tartaric.*

Heavy metals rarely found. W. L. Scoville.

Quality much improved. One lot had trace of copper. E. L. Patch.

*Aconite Root.*

Assays, 0.46 per cent. to 1.05 per cent. alkaloid. E. L. Patch.

One shipment was Japanese. H. H. Rusby.

*Agaric, Powdered.*

Contained 25 per cent. corn starch. H. H. Rusby.

*Alcohol.*

Sixty samples deficient. Ranged from 44.43 per cent. to 87.61 per cent. Massachusetts State Board of Health.

*Almond Shells.*

One shipment, probably to be used for adulterating cut drugs. H. H. Rusby.

*Ammonium Chloride, Purified.*

Two lots, excessively dirty and unfit for use. E. L. Patch.

*Ammonia Water.*

The stronger frequently contains traces of pyridine. W. L. Scoville.

*Ammonium Salicylate.*

Frequently dark colored. W. L. Scoville.

*Anise Seed.*

35 per cent. stems and other seeds.

One lot of powdered anise, 20 per cent. sand.

One, 28 per cent. of stones cut and sifted to resemble anise. H. H. Rusby.

*Arnica Flowers.*

Three lots of spurious. H. H. Rusby.

*Arnica Root.*

One lot spurious. H. H. Rusby.

*Asafetida.*

76.6 per cent. ash, partly gypsum. A. F. Judd.

One shipment of powder contained powdered exhausted birch bark. H. H. Rusby.

Alcohol solubility of powdered: 36.1 per cent., 25 per cent., 41 per cent. (33 per cent. ash), 36 per cent. (35 per cent. ash), 41.5 per cent. (42 per cent. ash), 22 per cent., 28.5 per cent., 36 per cent. E. L. Patch.

*Asparagus Seed.*

Two shipments of spurry seed labeled asparagus seed. H. H. Rusby.

*Balm Gilead Buds.*

Two shipments spurious. H. H. Rusby.

*Balsam Peru.*

A satisfactory test is the copper acetate for resin. The artificial responds to it, the genuine does not. A sample of artificial had sp. gr. 1.144 at 25° C. Cinnamon contents 64.8 per cent., solubility approximating the natural product. Acid resin, 1 G. = 2.1 Cc.  $\frac{N}{4}$ KOH. E. H. Gane.

Samples balsam Peru tested responded to all U. S. P. tests, giving cinnamein contents 56 per cent. to 58.88 per cent., but required 2 to 2.3 Cc.  $\frac{N}{10}$  KOH. E. L. Patch.

*Balsam Tolu.*

Varies considerably. W. L. Scoville.

*Belladonna Leaf.*

One shipment adulterated with *Scopola* leaves. One with 50 per cent. *Scopola* leaves.

One with 80 per cent. stems. One with 50 per cent. stems and fruit. H. H. Rusby—'08.

Assays 0.276 per cent., 0.273 per cent., 0.280 per cent., 0.35 per cent., 0.36 per cent., 0.35 per cent., 0.4 per cent. E. L. Patch.

*Belladonna Root.*

Seven shipments adulterated with 15 to 42 per cent. of poke root. Some also contained *Scopola* rhizome, or roots, or both. H. H. Rusby.

Assays from 0.33 per cent. to 0.53 per cent. E. L. Patch.

*Benzoin.*

One shipment of artificial. Three of Sumatra heavily loaded with chopped bark and sand. H. H. Rusby.

Three lots, 26 per cent., 30.12 per cent., 14.37 per cent. insoluble in alcohol mostly chips and bark. 1.06 per cent., 2.13 per cent., 0.63 per cent. ash. E. H. Gane.

*Buchu.*

Many shipments spurious. Many have a large amount of stems. H. H. Rusby.

*Camphor.*

Two lots containing oil and were low in rotary power. W. L. Scoville.

*Camphor Spirit.*

Fifty-eight out of 143 samples were deficient. Ran from 5 per cent. to 8 per cent. Pure Food and Drug Dept., Kans.

The usual method of assaying spirit of Camphor by salting out the camphor and redissolving in petroleum benzin, is improved by substituting benzole as the solvent.

A sample made strictly U. S. P. had a rotation of  $4^{\circ} 5'$  corresponding to 9.8 per cent. camphor. A sample certified by an analyst to contain but 7.5 per cent. camphor had a rotation of  $4^{\circ}$  in 100 Mm. tube corresponding to 9.26 per cent. camphor.

E. H. Gane.

*Camphorated Oil.*

Fourteen samples deficient. Contained from 1 to 16 per cent. Mass. St. Board Health.

*Cannabis Indica.*

One shipment largely seeds, two spoiled in curing, two grown in Africa. H. H. Rusby.

Ether soluble resin in drug from 10.86 per cent. to 12 per cent. In solid extract from 73.4 per cent. to 93.2 per cent. E. L. Patch.

*Cantharides.*

One shipment of *Mylabris* labeled cantharis H. H. Rusby.

*Capsicum.*

Contains much red lead. A. F. Judd.

Different samples give from 15 to 25.2 per cent. alcoholic extract. E. L. Patch.

*Caraway Seed.*

One shipment was *Nigella*. H. H. Rusby.

*Cascarilla Powdered.*

25 per cent. ash instead of 10 per cent. Jour. Am. Chem. Soc.

*Celery Seed.*

25 per cent. ground stone. A. C. Stallman.

*Chloroform.*

Frequently contains excess of chlorinated compounds. W. L. Scoville.



*Cinnamon, Ceylon.*

Quills had oil removed. Jour. Amer. Chem. Soc.

*Colocynth.*

Three lots contained ground seeds. H. H. Rusby.

*Conium Fruit.*

U. S. P. standard 0.5 per cent. Market lots 0.27 per cent., 0.42 per cent., 0.435 per cent., 0.45 per cent. E. L. Patch.

One lot of powdered contained powdered exhausted birch bark. One lot of whole 20 per cent. stems. H. H. Rusby.

*Copaiba Balsam.*

Adulterated with segna balsam. A dark brown tough, viscid mass. Acid number direct 14.04, saponification number 92.66 per cent. Has no color reaction and cannot be readily distinguished. Staff Apoth. Japanese copaiba, so-called, is Chinese wood oil, not copaiba. E. H. Gane.

Two lots rejected as not U. S. P. E. L. Patch.

*Cresol.*

Sp. gr. 1.0307. Boils 196° C.

Sp. gr. 1.0380.

Sp. gr. 1.0484.

Sp. gr. 1.0420.

All other tests were O. K.

Sp. gr. 1.0530. Boils 185° C.

One volume with one volume glycerin required two volumes of water to separate it.

Was not soluble in 60 parts of water. E. L. Patch.

*Creosote.*

A sample of phenols received labeled Beechwood Creosote. W. L. Scoville.

*Coto Bark.*

Five shipments coto or paracoto spurious. H. H. Rusby.

*Cummin Seed.*

Adulterated with teazle seed. A. C. Stallman.

*Curuma.*

Two lots adulterated with starch. H. H. Rusby.

*Dandelion.*

One shipment of cut was trimmings from chicory. One contained 48 per cent. of stones cut and sifted to resemble dandelion fragments. H. H. Rusby.

*Digitalis, Powdered.*

One lot contained powdered stramonium. H. H. Rusby.

*Ether, Nitrous, Concentrated.*

Contained 81.8 per cent. to 87.12 per cent. of nitrous ether. W. L. Scoville.

*Euphorbium, Powdered.*

Contained 25 per cent. corn starch. H. H. Rusby.

*Gamboge.*

25 per cent. corn starch. H. H. Rusby.

U. S. P. standard not more than 25 per cent. insoluble in alcohol nor more than 3 per cent. ash.

22.7 per cent. insoluble 1 per cent. ash.

22 per cent. insoluble 1.4 per cent. ash.

31 per cent. insoluble 1.6 per cent. ash.

30 per cent. insoluble 1.6 per cent. ash. E. L. Patch.

*Gentian Root, Powdered.*

Adulterated with 25 to 50 per cent. ground fiber. One lot with olive stones. H. H. Rusby.

*Ginger Root, Powdered.*

African was exhausted root treated with capsicum. Journ. Amer. Chem. Soc.  
*Glycerin.*

Nearly half the samples contained a trace of arsenic. W. L. Scoville.

*Gold and Sodium Chloride.*

22.96 per cent. to 29.5 per cent. gold chloride. W. L. Scoville.

*Honey.*

Several lots contained added invert sugar. W. L. Scoville.

*Hyoscyamus.*

Two shipments contained stramonium. One 28 per cent. sand. Three were spurious. One lot of powdered contained hyoscyamus muticus. H. H. Rusby.

Assays—0.063 per cent., 0.08 per cent., 0.101 per cent., 0.100 per cent., 0.102 per cent. E. L. Patch.

*Goldenseal.*

Assays—2.28 per cent., 2.52 per cent., 2.9 per cent., 3.1 per cent., 3.28 per cent. hydrastine. E. L. Patch.

*Iodine Tincture.*

Ninety-two samples assayed from 3 per cent. to 16 per cent. E. H. Jenkins.

Ten samples, 2.07 G. to 3.85 G., to 100 Cc. Mass. State Board Health.

*Ipecac.*

One lot of powdered contained 50 per cent. olive stones. H. H. Rusby.

Seven lots Rio, 2.08 per cent., 1.82 per cent., 2.27 per cent., 2.06 per cent., 2.1 per cent., 2 per cent., 2.15 per cent. alkaloids.

Eight lots Carthage, 2.8 per cent., 2.47 per cent., 2.1 per cent., 2.2 per cent., 2.57 per cent., 2.4 per cent., 2.2 per cent., 2.5 per cent. alkaloids.

Two lots E. I. Lahore, 2.19 per cent., 2.09 per cent. alkaloids. E. H. Gane.

Nine lots, 1.46 per cent., 1.47 per cent., 1.46 per cent., 1.85 per cent., 2 per cent., 2 per cent., 2.09 per cent., 4.4 per cent., 2.25 per cent. alkaloids. E. L. Patch.

*Iron Hypophosphite.*

Contains excess of calcium. E. L. Patch.

*Iron and Potassium Tartrate.*

Often contains ammonia. Is not U. S. P. E. L. Patch.

*Jambul Seed.*

One lot wholly wormy and hollow. H. H. Rusby.

*Jaborandi.*

One lot labeled "Piper." H. H. Rusby.

Lot of black jaborandi assayed only 0.05 per cent. E. H. Gane.

*Jalapin.*

Market products under this name range from those containing 28 per cent. resin and 49 per cent. alcohol insoluble matter, to pure resin. E. L. Patch.

*Kamala.*

One shipment loaded with sand, one with olive stems, one olive stems and sand, one ground bark. H. H. Rusby.

Two samples, 40.8 per cent. acid 43.4 per cent. ash, mostly sand.

U. S. P. Standard, 8 per cent. E. H. Gane.

*Lactucarium.*

One shipment moldy through and through. H. H. Rusby.

*Lavender Flowers.*

One shipment dyed blue. H. H. Rusby.

*Licorice Root, Powdered.*

Consisted of powdered peelings of Russian licorice. H. H. Rusby.

*Lycopodium.*

Two shipments adulterated with pine pollen.

One with potato starch. H. H. Rusby.

*Magnesium Carbonate.*

Residue on Ignition.	Per cent. Oxide.	Per cent. Foreign Salts.
39.94	96.14	2.7
40.35	96.29	2.75
42.15	95.56	1.7
U. S. P. 40	96	1
42.1	85.56	0.7
41.65	96	0.7
42.1	97.1	0.6
42.2	97	0.5 E. H. Gane.
43	99.13	
46.2	91.19 excess.	
44.2	91.55 "	
42.3	91 "	
42.6	93 "	
43.8	95.64 "	
44	94.14 "	E. L. Patch.

*Magnesium Oxide.*

Several lots excess of iron.

*Majoram.*

One shipment Origanum Onites. H. H. Rusby.

*Matico.*

Five bales spurious. H. H. Rusby.

*Menthol.*

Several lots contained excess of oil. W. L. Scoville.

*Mullein.*

One shipment was *Nicotiana rustica* labeled mullein to escape duty. H. H. Rusby.

*Mustard.*

One lot was charlock seed. H. H. Rusby.

*Nux Vomica.*

One lot heavily coated by rolling in mud of same color. H. H. Rusby.

Assays 1.208, 1.268, 1.25, 1.25, 1.221 strychnine. E. L. Patch.

*Oil Sweet Almonds*

Sp. gr.	Saponification Value.	Iodine Number.
0.914	191.3	95.1
0.9132	191.2	99.83
0.9144	191.2	99.87
0.9144	191.2	99.7 E. L. Patch.

*Oil Star Anise.*

The genuine may have a congealing point of 13° C., or 15° C. Some genuine oils are slightly right rotary.

	Sample 1.	2.	3.	4.	5.
Sp. gr.....	0.984	0.982	0.980	0.980	0.974
Rotation .....	+0.15°	+0.15°	+0.7°	+0.2°	+0.25°
Congeaing point.....	14	15	15	13	12.8
Solubility in 95 per cent. alcohol..	normal.	normal.	normal.	normal.	1 in 3.

Sample No. 5 was personally distilled from dried fruits using steam. E. H. Gane.

*Oil Clove.*

One a by product from manufacture of vanillin.

Sp. gr. 1.042, 1.0452, 1.048, 1.044, 1.040.

Eugenol 87, 86, 86, 81.5, 86. E. L. Patch.

*Oil, Ethereal.*

Still exceedingly difficult to obtain a U. S. P. product. The so-called heavy and light oils of wine offered by makers do not in any way represent the official. All are lighter than water, while the U. S. P. is heavier. They consist of hydrocarbons entirely. The ethereal sulphate called for in the official is absent. E. H. Gane.

*Oil Lemon.*

Largely adulterated with turpentine and alcohol. A. C. Stallman.

*Oil Olive.*

Many samples condemned on account of faulty U. S. P. tests. Pure oils will not solidify in the cold by the test given. Heat is necessary. The old 1890 test was better. E. H. Gane.

*Oil Pennyroyal.*

For a time the Am. out of the market.

Four market samples had average sp. gr. 0.9225.

Rotation  $+20^{\circ} + 20.7^{\circ} + 19^{\circ} + 31^{\circ}$ . All soluble in 2 volumes of 70 per cent. alcohol. E. L. Patch.

*Oil Peppermint.*

Often contains petroleum oil.

Sp. gr.	Rotation.	Menthol.	Petrol. oil.
0.892	$-13^{\circ}$	30 per cent.	46 per cent.
0.891	$-12^{\circ}$	29 " "	44 " "
0.893	$-14.3^{\circ}$	29.5 " "	48 " "
0.8875	$-14^{\circ}$	29 " "	49 " "
0.875	$-13^{\circ}$	31 " "	45 " "

—Parry Chem. and Drug.

Six lots.

Sp. gr.	Rotation.	Total	
		Menthol.	Menthyl.
0.9045	$-21.5^{\circ}$	54.97 per cent.	7.69 per cent.
0.899	$-25^{\circ}$	52.05 " " Acet.	7.67 " "
0.9015	$-27.5^{\circ}$	60 " "	7.08 " "
0.9020	$-27^{\circ}$	54.1 " "	8.93 " "

Two lots, sp. gr. 0.899. Other tests faulty; rejected. E. L. Patch.

*Oil Rose.*

Sp. gr.	Congealing point.	Sapon. number.
0.8635	20° C.	10.67
0.8634	20° C.	10.92
0.8656	20° C.	14.45

U. S. P.

18 to 22 per cent.

10 to 17

*Oil Rosemary.*

From same plants in different seasons were + rotary one season, — the next. H. J. Henderson.

*Oil E. I. Sandal.*

Rotation ..	$-17.7^{\circ}$	$-18.7$	$-18.7^{\circ}$	$-16.8^{\circ}$
Sp. gr. ....	0.9790	0.9750	0.9722	0.9736
Santalol. . . .	92 per cent.	92.66 per cent.	92.18 per cent.	91.74 per cent.

One lot, rotation  $-15.4^{\circ}$ , made clear solution in 5 volumes 70 per cent. alcohol; foreign odor; rejected.

Another, —15.2°, sp. gr. 0.9705, soluble in 5 volumes of 70 per cent. alcohol. 91.2 per cent. santalol, had foreign odor. E. L. Patch.

*Oil Sassafras.*

Largely diluted with oil of camphor. Pancoast & Pearson.

*Papain.*

1 part in acid solution converted 0.4 part egg albumen.

1 " " alkaline " " 3.5 " " "

1 " " neutral " " 6 " " "

Its power for converting albumoses into peptones is practically nothing. 5 G. gave from 0.125 to 0.139 G. in different media. E. H. Gane.

*Pilocarpine Hydrochloride.*

25 per cent. sulphonal. A. Langard.

*Pinkroot, Powdered.*

Many lots spurious. H. H. Rusby.

*Podophyllin.*

Alc. sol.	Ether sol.	Chlorof. sol.	Ash.	Moisture.
99 per cent.	75 per cent.	67 per cent.	1 per cent.	
Completely.	75.9 " "	70.6 " "	4 " "	4.4 per cent.
98.4 per cent.	85 " "	67.5 " "	3 " "	
98.9 " "	53 " "	65.4 " "	1 " "	
99.3 " "	63 " "	70 " "	0.5 " "	
99 " "	75 " "	67.6 " "	1 " "	
99.2 " "	82 " "	65 " "	1 " "	E. L. Patch.
95 " "	80 " "	66 " " water sol.	20 " "	
96 " "	68 " "	63 " "	20 " "	
U. S. P.				
99 per cent.	75 " " min.	65 " " min.	25 " " max.	
				E. H. Gane.

*Potassium Citrate.*

Two lots contained heavy metals. E. L. Patch.

*Potassa.*

Range from 81.6 per cent. to 88.9 per cent. KOH. One was a mixture of KOH and NaOH. W. L. Scoville.

*Potass. Iodide.*

Thirty samples. One contained iron, one iron and dirt, 2 excess of moisture and free iodine. E. L. Patch.

*Quince Seed.*

One shipment adulterated with very young quinces chopped and dried. H. H. Rusby.

*Saffron.*

Two shipments were Calendula flowers heavily weighted and stained. Many shipments are loaded with oil and inorganic salts. H. H. Rusby.

*Sage Powd.*

Contained 50 per cent. corn starch. H. H. Rusby.

*Salol.*

One lot contained a small amount of salicylic acid. W. L. Scoville.

*Santonica.*

Contained exhausted powdered birch bark. H. H. Rusby.

*Sarsaparilla, Mex.*

Three lots all butts or rhizomes. H. H. Rusby.

*Scammony Root.*

Three shipments of false roots. H. H. Rusby.

*Scopola.*

One lot of Japanese scopola very deficient in alkaloid. H. H. Rusby.

*Senega.*

Mixed with twigs and shoots of polyg. senega and with roots of ginseng, American valerian, etc. Inland Rev. Dept., Canada.

*Senna.*

Many shipments of siftings labelled broken senna. H. H. Rusby.

*Soap, Castile.*

Several samples contained animal fats. W. L. Scoville.

*Soda.*

Commercial grades, 87 per cent. to 98.7 per cent. NaOH. All contain small amount of chlorides. W. L. Scoville.

*Sodium Phosphate.*

One sample in five gave a slight trace of arsenic. W. L. Scoville.

One pound tins contained from 13 to 14 ozs. E. L. Patch.

*Strophanthus.*

Two shipments, brown, spurious. H. H. Rusby.

*Sugar, Granulated.*

Usually contains small amounts of reducing sugars. W. L. Scoville.

*Tansy.*

Entire herb cut up. H. H. Rusby.

*Terebene.*

Resinifies on standing and gives more or less colored residues.

Sp. gr.	10 Cc. gave	residue.	
0.8610	0.995		
" 0.8620	" 0.112	"	
" 0.8690	" 0.250	"	
" 0.8610	" 0.125	"	
" 0.8600	" 0.130	"	E. L. Patch.

*Thyme.*

One shipment was origanum. One was winter savory. H. H. Rusby.

*Tragacanth, Powd.*

Adulterated with powd. acacia or starch, or both. C. E. Vanderkleed.

*Wax.*

One sample of yellow and one of white contained paraffin. W. L. Scoville.

Following samples of yellow wax were all pure:

Source.	Sp. gr. at 25° C.	Melting-point.	Acid No.	Saponification No.
India.....	0.953	62° C.	18.8	92.7
Cuba.....	0.963	62.5° C.	18.35	93
Cuba.....	0.955	62.8° C.	19.9	98.3
Morocco...	0.960	64° C.	19.9	100
China.....	0.956	65° C.		95
Tahiti ....	0.960	63° C.		97
Germany ..	0.953	65.5° C.		96.8

*White Wax.*

Three lots pure, 4 and 5 adulterated with paraffin and a little stearic acid.

Sp. gr. at 25° C.	Melting-point.	Acid No.	Saponification No.
0.955	63° C.	21	95
0.956	63.5° C.	19.88	97.76
0.960	63.5° C.	18.25	93.32
0.928	58° C.	12	39.86
0.932	59° C.	13.81	33.25

E. H. Kane.

## SUPPLEMENTARY REPORT OF COMMITTEE ON DRUG MARKET.

BY L. F. KEBLER.

From the title of the committee I take it that in this report we are to consider the drug market, not only from the point of inferior or adulterated drugs, but also drugs of a character misbranded under the Federal and State laws. The Federal law has been in active operation for about one year. Several of the States have done excellent work. There is no question whatever but that the influence of these laws in general has been for the betterment in the quality of drug products. In fact, such as have been examined of domestic origin have complied with the standards set for purity with a few exceptions. It should, however, be stated in this connection that our investigations in this direction have not as yet been very extensive. I shall consider drugs in this report under two heads: first, inferior and adulterated; second, misbranded.

## DOMESTIC INFERIOR AND ADULTERATED DRUGS.

Our examinations of domestic goods were restricted largely to chemicals, and it is gratifying to note that a large proportion of those examined, probably 90 per cent. have complied with all of the prescribed standards, and those which have fallen short were deficient only in minor points. A list of these chemicals and the points in which they are deficient follows:

## LIST OF CHEMICALS DEFICIENT IN STRENGTH OR CONTAMINATED WITH IMPURITIES.

*Acetone.* One sample, suspended impurities, excess of aldehyde. Two samples excess of aldehyde.

*Alcohol.* Twelve samples. The article as supplied in barrels has never been found to comply with Pharmacopœial standards relative to limits of aldehydes and other materials which reduce silver nitrate and develop a coloration with potassium hydroxide solution. If, however, alcohol is purchased in galvanized iron drums these deficiencies are readily overcome. The strength of the samples were in every case in conformity with the Pharmacopœial standard. A number contained an excess of non-volatile matter.

*Ammonium Bromide.* Gave turbid solution.

*Ammonium Carbonate.* Two samples. One titrated 61.7, another 70.32 purity.

*Ammonium Chloride.* Two samples contained iron.

*Ammonium Citrate.* Contained trace of lead.

*Ammonium Hydroxide.* Six samples. Four contained pyridine, five trace non-volatile matter on steam bath, two carbonates in excess.

*Animal Charcoal.* U. S. P. purified. Two samples. One contained 74.5 per cent. of ash, the other 81.87 per cent.

*Barium Chloride.* Salts of sodium and calcium present.

*Benzoic Acid.* Two samples. Chloride present.

*Benzole.* Two samples. Thiophene and carbonizable material present.

*Boric Acid.* Trace iron, chloride and sulphate.

*Calcium Peroxide.* One sample 59 per cent. purity.

*Carbon Tetrachloride.* Two samples. Contained carbon bisulphide.

*Chloral Hydrate.* Two samples, contained trace chloral alcoholate and trace of chloride.

*Chloroform.* Five samples, contained considerable suspended impurity.

*Chromic Acid.* Contained sulphates.

*Citric Acid.* Two samples, one contained trace iron, the other impurities in suspension and sulphates.

*Glacial Phosphoric Acid.* The article sold under this name is not phosphoric acid, but metaphosphoric acid mixed with either sodium pyrophosphate or sodium metaphosphate or both. On dissolving material in water it reverts to phosphoric acid. The name glacial phosphoric acid however is a misnomer.

*Hydrogen Dioxide.* Ninety-five samples including all of the available brands have been tested. Most of them complied with the Pharmacopoeial standard, except that with few exceptions they contained acetanilide as a preservative. Caffeine was found in one. Its use probably was that of a preservative. The volume of available oxygen was with few exceptions in accordance with the Pharmacopoeial standard. Several, however, were excessively acid, and a few were low in strength and deteriorated rapidly.

*Hydrochloric Acid.* Contained sulphate and calcium chloride.

*Lead Acetate.* One sample. Contained iron and alkaline earths.

*Lead Oxide.* Three samples. One contained a salt of aluminum, another material insoluble in acetic acid, and the third was contaminated with lead chloride.

*Magnesium Carbonate.* This product with few exceptions fails to comply with the Pharmacopoeial standard, and manufacturers are resorting to the expedient of labeling with the phrase "For technical use" thinking by this scheme to evade the law. This method of labeling, however, is liable to precipitate trouble for druggists using same in the manufacture of certain Pharmacopoeial products.

*Magnesium Oxide.* Six samples. Four contained calcium oxide, three iron compounds and three sodium carbonate and chloride.

*Potassium Bromide.* Contained traces of iron and sodium salt.

*Potassium Bisulphite.* Virtually potassium sulphate.

*Potassium Carbonate.* Contained chlorides.

*Potassium Iodide.* Two samples contained iodates.

*Sodium Benzoate.* Contained an undue amount of chloride.

*Sodium Bisulphite.* Deficient in strength.

*Sodium Bromide.* Contained excess of sulphate, chloride and carbonate.

*Sodium Carbonate.* Anhydrous. One sample 85.89 per cent. pure, another contained trace of arsenic.

*Sodium Chloride.* Two samples contained excessive moisture, tested 93.66 and 94.19 per cent. pure.

*Sodium Salicylate.* Gave very dirty solution.

*Sodium Sulphite.* During the past few years there have been examined in Bureau of Chemistry twenty samples of sodium sulphite with range of purity varying from 72.16 to 92.06 per cent. Thus far we have been unable to secure samples containing 94 per cent. of pure sodium sulphite, the lower standard of the present Pharmacopoeia. It would therefore look as if the Pharmacopoeial standard was still a little high.

*Tartaric Acid.* One sample contained lead and sulphate; another iron and sulphate.

#### PLANT PRODUCTS.

A few plant products were examined, and while the results were not as satisfactory as in the case of the chemicals, on the whole improvement is noted. A list of the drugs and their shortcomings is herewith submitted.

*Cannabis Indica.* Consists of *C. sativa* staminate flowers and seed, cornmeal, and trace of chestnut leaves.

*Cloves.* Two samples contained mustard hulls and leguminous seed.

*Hyoscyamus niger,* stemmy, contained traces of flax and stramonium, and excess of mineral matter.

*Mustard.* Contained wheat starch and turmeric.

*Pepper, Black.* Thirty samples were examined. 3 contained leguminous starch: 2



leguminous seed; 3 long pepper; 2 mustard hulls; 2 contained long pepper, one of which contains trace of ginger; 1 small amount of ginger; one wheat, capsicum, fruit shells (cocoanut and olive pits); 2 leguminous starch, long pepper and foreign ground wood; 1 pepper shells (probably long pepper); 1 fruit stones; 2 olive pits; 1 capsicum and ginger; 1 olive pits and traces of wheat and corn starch; 1 olive pits, mustard shells, capsicum, traces of wheat-starch, buckwheat starch, and ginger; 1 corn starch; 1 olive pits, mustard hulls, rice meal, linseed, wheat and other cereals, cloves and weed-seed; 1 wheat, flax, buckwheat, cocoanut shells, traces of leguminous seed, coffee and red pepper; 1 long pepper and small amount of ground olive pits; 1 foreign stone cells, small amount of long pepper; 1 olive stones, coffee hulls, capsicum seed, cockle, wheat and cereal starch.

*Pepper, Red.* Two samples contained mustard hulls, rye, wheat, corn and ginger artificially colored.

*Pepper, White.* Thirteen samples were examined. Five contained leguminous seed; one contained wheat, capsicum and other vegetable impurity; one wheat and rice; one cracker crumbs and ground almond or olive stones; one corn meal and olive pits; one cracker crumbs; one mustard hulls; one wheat and rice; one nut shells and olive pits.

*Pimento.* Contained nut shells, mustard hulls and leguminous seed.

#### MISBRANDED DOMESTIC DRUGS.

*Antipain Pills.* Dr. ———'s contained 32.95 per cent acetanilide, not declared.

*Cascara and Quinine preparation.* Contains 37.5 per cent. acetanilide, not declared.

*Cold and Grippe Cure.* Contained 10 per cent. acetanilide, not declared.

*Cold Push.* Contained 32.26 per cent. of acetanilide, not declared.

*Cold Tablet.* Claims quinine, but cinchonine substituted.

*Headache Elixir.* Label states alcohol, acetanilide and phenacetine as being present. Quantity or proportion not indicated.

*Headache Powder.* Contains acetanilide. Not declared.

*Tonic Headache Wafers.* Dr. ———'s contained 20.3 per cent. acetanilide not declared.

Fourteen months ago inspection and analysis of imported drug products was instituted at the Port of New York and inspections at other Port Laboratories were instituted as soon thereafter as suitable arrangements could be made. The quality of the goods imported and the methods resorted to by a few importers, brokers and dealers were in many cases totally unexpected and surprising. There appeared to be a feeling in certain quarters that the law would not be enforced relative to imported drug products and the findings of the drugs imported at New York would certainly indicate that many transactions were made on this basis. Many forms of adulterations have been met varying from entire substitutions to adulteration of a minor degree. It is not necessary to give each one in detail, but the principles involved in a few cases will give a fairly good idea of the situation, especially when considered in connection with the list of improper products submitted below. One of the common forms of adulteration met with was colored calendula florets so dyed that the finished product resembled saffron very closely. It is admittedly prepared solely as an adulterant of saffron. In a recent importation of this character the product was in addition loaded with calcium sulphate to the extent of 45 per cent. Another typical example is the importation of senna products under various names, such as senna dust, senna siftings, senna sweepings, etc. These products contain in some cases as much as 35 per cent. of sand and other inorganic matter and are contaminated with organic materials of various kinds which undoubtedly deleteriously influence the medicinal value of either the sennas themselves, or any preparation in the manufacture of which they may be used. Belladonna root adulterated with varying amounts of poke

root has also been offered a number of times for importation, and alkaloidal content was usually low in proportion to the per cent. of poke root present. Another conspicuous example of adulteration is asafetida. For some time asafetida of good quality was imported but dealers finally grew bolder and began bringing in goods which were materially below the prescribed standard. The degree of sophistication appeared to increase with successive importations, until finally an importation was offered which averaged as low as 15 per cent. alcohol-soluble material and in one case the amount was as little as 9.1 per cent. The contention is made that any product sold under a Pharmacopoeial name and irrespective of its quality may be imported, provided its own standard of strength, quality or purity be declared upon the box, bottle or other container. Fortunately, however, this apparent laxity in section 7 is carefully safeguarded by part of section 11, which reads as follows:

"And if it appears from the examination of such samples that an article of food or drug offered to be imported into the United States is adulterated or misbranded within the meaning of this Act, or is otherwise dangerous to the health of the people of the United States, or is of a kind forbidden entry into, or forbidden to be sold, or restricted in sale in the country in which it is made, or from which it is exported, or is otherwise falsely labeled in any respect, the said article shall be refused admission, \* \* \*."

It is well known, for example, that adulterated asafetida or senna dust, or belladonna root adulterated with poke root, do not conform with the standards prescribed by the German Pharmacopoeia, and their sale by the apothecaries of Germany is therefore forbidden, which is ample ground to preclude the importation of these goods provided they are manufactured or exported from Germany. A list of the adulterated goods and the manner in which they are deficient follows:

*Asafetida.* 54 cases. Of these 46 were detained, because of variation from the pharmacopoeial standard. In all cases the per cent. of alcohol-soluble material was below the standard, varying from 48.02 to 9.1 per cent. One importation, consisting of eight cases, conformed with the requirements in every detail. The alcohol-soluble material varied from 50.5 to 67.44 per cent., and the ash content from 3.63 per cent. to 14.88 per cent. This clearly shows that asafetida of pharmacopoeial strength can be secured if desired.

*Balsam Peru, Synthetic.* Purely fictitious product.

*Calendula.* A number of flagrant adulterations were found on examination of this product. Six samples were found to contain a quantity of ash, ranging from 49.16 per cent. to 54.81 per cent., the chief adulterant being calcium sulphate. Aside from being heavily adulterated with inorganic salts, these samples were colored with aniline dye. It is tacitly admitted that this product was to be used to adulterate saffron.

#### COPAIBA.

*Copaiba.* 125 samples. Nearly all of the copaiba entered at the New York port is of South American origin. It is packed in the so-called "oil tins," of about five gallons capacity, two in a box. The "oil tins" are cans in which petroleum or other commodities have been shipped to the land of copaiba. There is a great variation in both the physical appearance and the composition of the various copaibas. Each of two tins in the same box may contain articles entirely dissimilar in character. Of a shipment of 32 boxes, 11 samples were examined. There was every shade of color from a colorless copaiba to a dark brown. Some were clear, others turbid, and some contained a crystalline deposit. Two samples were free from gurjun by the original pharmacopoeial test, but the remainder contained from 2 to 15 per cent. of this adulterant. Some of these variations appear to be due to the mode of collection. The shippers' agents state that the copaiba is collected by natives in gourds and then brought to the buyer. In this

manner trees other than those yielding copaiba are apt to be tapped. The material so collected is not mixed in large containers to bring about uniformity, but is poured directly into the empty "oil tins" and sent back in the original boxes in which they were received.

Twelve varieties of copaiba have been entered at New York: Para, Canime, Baranquilla, Maracaibo, African, Bahia, Cartagena, Bolivar, Trinidad, Panama, Casulano and Port of Spain. Of these the Para, Maracaibo, Bolivar, Baranquilla and Canime are the most numerous. The Para, Baranquilla and Bolivar seem to be freest from adulteration, and are as a rule light-colored and clear.

An examination of 125 samples as imported gave the following data:

	Range.	Average.
Specific gravity . . . . .	0.973-0.999	0.986
Refraction . . . . .	1.5085-1.545	1.5134
Resin mass. . . . .	39-62.8 per cent.	50.9 per cent.
Resin acid (Cc. $\frac{1}{2}$ KOH per gram) . . . . .	2.3- 3.13	2.72
Acid number. . . . .	64.8-87.6	76.2
Gurjun present in 20 per cent.		
Resin limit all O. K.		
Fixed oil in none.		
Mineral oil in none.		

The volatile oil gave the following:

Specific gravity, 0.893-0.905.  
 Rotation, ( $-3^{\circ} .3'$ ) to ( $-11^{\circ} 5'$ ).  
 Refraction, 1.4907-1.4908.  
 Solubility in alcohol, (1-3) to (1-5).  
 Percentage of oil by steam, 39 per cent.-50 per cent.

The tests of the Pharmacopœia for copaiba are at the best unsatisfactory. The solubility in the various organic solvents is variable. Alcohol and petroleum benzin behave differently with different samples. Although it has been claimed that gurjun balsam can be detected by means of the solubility in benzin, this does not seem to be the case, for some copaibas without any gurjun give a turbidity and sometimes a decided precipitate.

The recognition of turpentine by the odor is very uncertain. The examination of the first five Cc. of the distillate would give better results. Fixed oils are more readily detected by the saponification or ester numbers.

The gurjun test as originally given will detect as low as 2 per cent. of added balsam. The revised test, however, is useless unless more than 25 per cent. of gurjun be present. We have found that the amount of gurjun balsam can be approximated to within 2 per cent. by using the old Pharmacopœial test and running blanks containing known amounts of the adulterant and comparing the colors developed.

At this point it might be well to draw attention to the fact that almost all shippers of copaiba claim that no gurjun balsam is obtained from South America and that to the best of their knowledge it is indigenous to the East. If this is the case, and none is imported there must be a tree, which grows in the districts where copaiba is collected, whose sap gives reactions identical with those of gurjun. This point requires investigation.

The Pharmacopœia states in connection with the original test that no red zone should be formed nor should the acid assume a red or purple tint on shaking, in carrying out this test. The red zone is given in over 75 per cent. of the samples examined. In fact,

comparatively few of the copaibas appear to be free from gurjun or some similar agent. With the revised test, whose delicacy is  $\frac{1}{2}$  of the old one, gurjun could not be detected in a single sample.

A comparative study of the separated resins of the copaibas and gurjun balsam has been undertaken with the view of determining some characteristics with the following results:

Variety.	Acid No.	Ester No.	Sapon No.	Iodine.
Para .....	61	81	142	17.5
Canime .....	127	60	187	13.6
Bolivar .....	147	81	228	15
Baranquilla .....	122	63	185	14
African .....	125	109	234	15
Bahia .....	77	92	169	15.6
Panama .....	108	72	180	16
Trinidad .....	155	84	239	14.3
Port of Spain .....	144	72	255	14.5
Maracaibo .....	130	63	193	14.6
Casulano .....	150	36	186	14.7
Cartagena .....	124	63	187	16.4
Gurjun .....	36	67	103	18.8
Cativo* .....	130	24	154	21.8

Variety.	Surinam Test.	CHCl <sub>3</sub> Br <sub>2</sub> (1-20).	Acetic Anhydride Br <sub>2</sub> (1-20).
Maracaibo .....	Purple.	Yellowish.	Light Blue.
Para .....	No reaction.	No reaction.	Light Blue.
Cartagena .....	Reddish.	Reddish.	Dark Green.
African .....	Violet.	Blue.	Green.
Port of Spain .....	Red.	Wine Red.	Green.
Trinidad .....	Wine Red.	Wine Red.	Blue.
Panama .....	Violet.	Purplish.	Blue.
Bolivar .....	Wine Red.	Pink.	Blue.
Canime .....	No reaction.	No reaction.	No reaction.
Gurjun .....	Blue.	Intense blue.	Blue.

The above results show that our knowledge of copaiba as to botanical source, chemical composition, physical properties and identity tests is far from satisfactory.

*Copaiba Capsules.* Six lots examined, two of which were misbranded as manufacturer and deficient in quantity claimed, and four contained 25 per cent. gurjun balsam.

*Feminelle.* Two samples of this product were examined and found to consist of calceola florets, colored with an aniline dye, and loaded with a fixed oil. These products are imported into the U. S. under the trade name "Feminelle," which is a recognized adulterant of Spanish saffron.

*Jalap Root.* Less than half the strength of the U. S. P. product.

\* Cativo balsam, segura balsam and hardwickia have been stated to be adulterants of copaiba. Of these we have been able to obtain but the cativo.

*Lupulin.* Contained approximately twice as much ash as allowed by U. S. P.

*Magnesium Citrate Effervescent.* Contained no citric acid, citrate or salts of magnesium.

*Magnesium Citrate Granular.* Contained no citric acid or citrate, and only a trace of salts of magnesium.

*Saffron.* A number of gross adulterations was met with in this product. Six samples were found loaded with the chlorides, sulphates and nitrates of sodium and potassium ranging from 27.70 per cent. to 41.24 per cent. In addition, two samples contained approximately 19 per cent. of moisture. One of the samples imported under the name *Asafran*, which is the Spanish for saffron, was composed of calendula florets artificially colored with an aniline dye aside from being heavily loaded with inorganic salts, and one sample contained 6.5 per cent. of added oil.

*Santal Oil.* A number of samples were found to be deficient in santalol content.

*Scammony.* Contained about one-third the ether-soluble resins required by U. S. P.

*Sweet Almond Oil.* Contained largely if not entirely peach and apricot kernel oil.

*Valerian Root.* Contained a large excess of ash.

#### MISBRANDED IMPORTED DRUGS.

The products enumerated below are chiefly misbranded, but it is sometimes difficult to separate misbranded from adulterated:

*Absinthe.* Claims medicinal properties. Contained 50 per cent. alcohol, which was not declared.

*Antihysteria Preparation.* Contained 58.75 per cent. of alcohol and 16.16 per cent. of ether, neither of which was declared.

*Aromatic Tincture.* 61.20 per cent. alcohol present and not declared.

*Blackberry Brandy.* Contains 36.9 per cent. alcohol, which is not declared, and is not brandy, but cordial.

*Black Currant Cordial.* Alcoholic content 20.7 per cent., and not declared.

*Castor Oil Capsules.* 3 lots. Misbranded as to manufacturer.

*Cocaine.* Crude product contained 92.2 per cent. anhydrous ether-soluble alkaloids. Cinnamyl cocaine present.

*Compound Oil of Santal and Cubeb Capsules.* 3 lots. Misbranded as to manufacturer.

*Cough Mixture.* Contains alcohol 14.4 per cent. and morphine. Neither declared.

*Cubebs.* Contained an excess of stems.

*Cure All.* Contained 13.06 per cent. alcohol, which was not declared.

*Dalby's Carminative.* Alcohol and opium present. Not declared.

*Diuretic and Antidyspeptic.* Contained 43.85 per cent. alcohol. Not declared.

*Effervescent Citrate.* Contained no citric acid or citrate.

*Effervescent Quinine.* Quinine was substituted by extract of cinchona.

*Empleurum Serrulatum.* Not true to name, and contains an undue amount of foreign material, stems, flowers, etc.

*Elixir of Life.* Contains 38.38 per cent. alcohol. Not declared.

*Ferrous Carbonate Pills* (Blaud's). Contained a little more than  $\frac{1}{2}$  the quantity of ferrous carbonate required by the U. S. P.

*Ferrous Iodide Pills.* One sample contained about  $\frac{1}{3}$ , another  $\frac{2}{3}$  the quantity of ferrous iodide required by the U. S. P.

*Fluidextract of Kola.* 55 per cent. alcohol present and not declared. No kola present.

*Gold Cure for Asthma.* Contained 70 per cent. of alcohol. Not declared. No gold present.

*Glonoïn.* 82.4 per cent. alcohol present and not declared.

*Gout and Rheumatism Remedy.* 16.46 per cent. alcohol. Not declared.

*Hoffmann's Drops.* Contained 49.3 per cent. alcohol and 2 per cent. of ether. Not declared.

*Hoffmann's Geist.* Contained 50.7 per cent. alcohol and 5.5 per cent. ether. Not declared.

*Iodine Compound.* Claims 10 per cent. iodine; 0.55 per cent. iodine present.

*Medicinal Elixir.* Contains alcohol, not declared. Claims cocaine. None present.

*Medicinal Syrup.* Alcohol and morphine present. Neither declared.

*Orange Bitters.* Contained 35 per cent. of alcohol; not declared.

*Cvoid Gelatin and Gum Candies.* Contains opium; not declared.

*Pepsin Stomach Bitters.* Contains 50.3 per cent. of alcohol not declared, and test for pepsin negative.

*Pile Ointment.* Contains morphine; not declared.

*Proprietary Remedy.* Contained methyl alcohol, 76 per cent., and ethyl alcohol, 10 per cent. Methyl alcohol prohibited and ethyl alcohol not declared.

*Quinquina Compound.* 16.8 per cent. alcohol present; not declared.

*Rheumatism Remedy.* 17.37 per cent. alcohol; no declaration.

*Stomach Bitters.* 50.3 per cent. alcohol present; not declared.

*Tincture of Strophanthus.* 63.85 per cent. alcohol present, and not declared.

*Tincture of Digitalis.* 79.62 per cent. alcohol present and not declared.

*Toothache Drops.* Alcohol and chloroform; neither declared.

*Universal Rheumatism Drops.* Contained 42 per cent. of alcohol not declared.

*Vermouth.* Makes strong medicinal claims, contained approximately 20 per cent. of alcohol, which is not declared.

*Wafers Filled with Medicinal Powders.* Contained opium and phenacetin, not declared.

*Wine of Iron and Quinine.* Contained 14.15 per cent. of alcohol, which is not declared.

During the reading of the report just made, Mr. Kebler exhibited a number of samples of imported drugs, such as belladonna root sophisticated with polk root; mylabris, imported as cantharides, spurious arnica flowers, and a specimen of Mexican sarsaparilla, imported from England, adulterated and misbranded; also a specimen of alleged henbane, imported as such, but in reality *hyoscyamus muticus*. Mr. Kebler also submitted a sample of imported tansy, which was substantially stems. The department had had a great deal of trouble in keeping that out, he said. He exhibited a sample of artificial benzoin, imported, so cleverly manipulated, that the department has not yet been able to decide how to classify it.

The Chair suggested the reception of the report just made at this time, and expressed regret that the time was so limited that the Section could not hear more on this subject. Mr. Sayre, seconded by Mr. Asher, moved to receive, to take the usual course. Carried.

The Chair said the nomination of officers was next on the program, but in order to get the reading of the next paper in connection with the report

of the Committee on Drug Market, the Section would now hear Mr. Kraemer on a paper by Mr. Rusby, of New York, on Crude and Powdered Drugs at the Port of New York during the year 1907-8. Mr. Kraemer presented the report as follows :

CRUDE AND POWDERED DRUGS AT THE PORT OF NEW YORK DURING  
THE YEAR 1907-08.

BY H. H. RUSBY.

An experience of one year, studiously devoted to the examination of the crude drugs arriving at the Port of New York, and supplemented by the examination of many lots obtained after their entry into commerce and while being distributed to the consumer, has been found intensely interesting and instructive. It is the object of this paper to convey to the members of the Association as much as possible of this interest and information.

The instructions under which I work for the Drug Laboratory of the Bureau of Chemistry, U. S. Department of Agriculture, are to ascertain whether the drugs imported, and those distributed from one state to another, are true to name and of a fit quality for the manufacture of medicinal preparations. The method pursued is, first, to examine everything offered for import, which the inspector on duty is not sure is of standard quality, and to report a recommendation as to its being admitted or deported. Its actual admission or deportation is in the hands of the Treasury Department. If deported, it may be again shipped to this country, consigned to some other port, where it is believed that it is likely to be admitted, a belief that is sometimes justified by the subsequent course of events.

As a matter of fact, I have to record that a considerable number of drugs rejected at New York have afterward been encountered in commerce, and we have known an importer and the manufacturer for whom the goods were intended to haggle over the distribution of the expense connected with reimporting them at a port where "we know we can get them admitted." The statement may excite surprise, or even incredulity, that it is possible to recognize in commerce a particular lot of drug that was formerly rejected at the Port, but investigation will confirm it. For example, a certain lot of adulterated belladonna root is offered and rejected. The use of pokeroor as the adulterant would not be specific, but its presence in a certain percentage might be. When it is determined that *scopola* is also contained and that its percentage is the same in both lots, there is a strong probability that the two lots are one. There are many minor differences between different lots of the same drug which render the evidence of identity cumulative.

In another case a broker offers for import five tons of ground olive pits. On being questioned, he says they are for a party, whom he names, who

wishes to use them "as a filler for chicken-food." We know that the party named does not deal in chicken food, but only in drugs. We cannot reject the shipment, since it is exactly what it is labeled, and is neither adulterated nor misbranded. We watch the goods distributed by the party in question, and within a few months secure samples of nine of his powdered drugs, five of which contain large quantities of ground olive pits. Is there much doubt that these belong to the lot imported previously?

Let us devote a moment to the results, respectively, of errors in acceptance and in rejection, and first as to assayable drugs. It might be assumed that the error of admitting a drug deficient in alkaloidal percentage would not benefit the importer, since its deficiency would be at once detected, and it would be unsalable. The reverse is however true. With the present excessive scarcity of competent aids and the crudity of organization and methods natural to the incipient stages of such a work, the percentage of cases detected at the point of final distribution, in the form of medicinal preparations, is very small indeed. Many medicine-makers, large as well as small, even yet make no serious attempt to standardize their assayable articles. From these conditions it follows that some are not only willing to take their chances of detection with sub-standard drugs, but are actually on the watch to purchase them below the regular price for standard goods. It must also be remembered that if an importation is passed by the authorities this fact is apt to be used by the seller as a sort of guarantee that it is of standard quality. An error in admission is therefore very likely to result in serious consequences. If this is true of assayable goods, it is obviously far more serious in case of those for which there is no practicable standard, with the probability of detection correspondingly decreased.

From this it follows that importers desirous, as most of them are, of seeing the objects of the pure drugs law accomplished do not show good judgment when they apply pressure to secure the entrance of an article which they know to be defective.

Badly as the above class of errors work, they are, on the whole, rather less serious than errors in rejecting. A single act of injustice to an importer does more to discredit the law, to excite opposition to its administration and to alienate sympathy, than can be overcome by a long course of exact dealing, or by many acts of special consideration.

It therefore goes without saying that officials who are wide awake to these two contingencies will be scrupulously careful to avoid errors in either direction, and will, when in doubt, incline toward favoring the importer. In such cases, it is customary to "release without prejudice," by which is meant that that particular lot is passed, but that no precedent regarding articles of that character is to be regarded as being thereby established, it being held that in future better information may lead to reversal of action



This important fact regarding the attitude of our officials is not appreciated as it should be by our importers. There is too great a readiness among them to assume that the authorities are wrong when there are the best of reasons why they should have investigated thoroughly before taking action. The really surprising fact is that the importer frequently protests with great positiveness when, as subsequent events prove, he did not examine his own importation to ascertain its character. Numerous instances of this kind have occurred during the past year.

A prominent importer appeared before the Drug Section of the New York Board of Trade with the open charge that we had rejected his cut dandelion root "just because it had a little dust upon it"; but the inspectors had found that it yielded more than 48 per cent. of ash, about ten times the proper amount, and they had separated from it, by stirring in water, more than 40 per cent. of stones, ingeniously selected because of their similar color, and carefully sifted so as to be of the same size as the fragments of dandelion.

The rejection of a lot of Belladonna root brought forth not only a violent protest, but one not free from insulting allusions. The importer however, was later quite dismayed to be shown that there was not a fragment of belladonna in the shipment, it being all pokerooroot.

Another demanded to know on what grounds his Matico had been rejected, and on accepting an invitation to call and compare it with a genuine samples, declared himself perfectly satisfied that the decision was just.

An importer took the writer up to an open bag of bark and pointing down to it said: "There you are! Is not that genuine Simaruba?" "Which?" was the reply, as both hands were thrust into the bag and two totally different articles were drawn out. "Oh, of course," said he, "we only look into the bag; we can't be expected to go through it and examine it as you do."

A very large and important dealer nearly fainted on being told that his ground belladonna root was 50 per cent. olive pits, but soon learned, from his own investigations, that the miller to whom he sent his fine drugs to be ground was systematically abstracting a portion and substituting adulterants.

Doubtless the most important part of the year's results is the demonstration that much of the adulteration of drugs is intentional and studied, and is a business proposition purely. The importance of this demonstration can hardly be over-estimated. The plea of non-intent has been in the past the strongest defense offered. It should not have been regarded as a good one, even if justified, for responsibility is fixed, with or without good intent. In fact, however, this plea has been as effective as it was strenuous. Upon the presentation of conclusive evidence that a lot of drug was grossly impure, everybody would sit up and take notice, prepared to soundly condemn the offender; but up gets an apologist, and says, half

pleadingly, "I hope that the speaker does not mean to imply that there has been any *intentional* adulteration. It is certainly true that drugs are not always what they should be. Conditions of collection and commerce are such that this could not be expected, and I am very sure that the gentlemen concerned could never be suspected of so serious an act as that of intentionally adulterating an article intended for the use of the sick. Their character is irreproachable," etc, etc. Everyone drops back in his seat, concluding that the condition of affairs, though deplorable, is inevitable. If it is true in this case, who knows in which other case it is also true? The wicked adulterators who happen to be present mentally resolve that hereafter they will increase the 25 per cent. of adulterants to 50 per cent. and that they will be safe in adulterating a few more things which fear has previously led them to leave in the pure condition. The most effectual means possible has thus been employed for intrenching and extending the evil work.

This claim has worked very well on many occasions, simply because to dispute it was impracticable. It is a very easy, safe and agreeable thing for men to publicly claim non-intent for each other, but a very disagreeable and more or less dangerous thing for one to publicly charge evil intent. That condition will never again exist in this Association, so far as this subject is concerned. It is true that the great majority have no positive intent to engage in flagrant adulteration, and that a somewhat smaller majority are heartily opposed to it. Yet the evidence this day presented, of a strictly legal character, is conclusive that there is a large amount of adulteration, pursued on a systematic and scientific basis, and with the employment of expert assistance. It involves conspiracy to defraud among foreign shippers, home importers, millers and manufacturers. It is perfectly practicable to detect and criminally convict every one of the parties, and the evidence both intra- and interstate, for doing this in the case of a considerable number, is already on official file.

The question next arises "What then?" Many will insist upon wholesale punishment, but those who carry the responsibility for this great work have broad fields to overlook. Vengeance is not the object of law. The greatest possible good with the least possible harm, is the motto of the real reformer. If a new *entente*, in which coöperation for the common good is general, can be brought about, it will be worth any sacrifice that can be made. When it appears that no amount of rational procedure or patient treatment can turn some offender, it will be time to inflict upon him a punishment so great that it will never be forgotten either by him who suffers or by those who see.

This brief statement of the case, sustained by the evidence of the specimens exhibited, must be considered in connection with my paper of last year, in which I showed that most of the imperfections in products were due to very great, though not ultimately insuperable difficulties connected

with collecting and preparing supplies, and to incompetence and carelessness on the part of those engaged in the distribution of our supplies.

I reiterate the statement then made that no man should be permitted to engage in the distribution of drugs in any way, who has not been compelled to undergo an examination as to his practical competence, and received a license; the same as the pharmacist is obliged to do. His license should furthermore be subject to revocation if it can be shown that he is abusing his privileges.

As to the difficulties regarding collecting, there is no escape from the conviction that we must gradually work toward the production of drugs by agricultural methods. If an improvement in the quality of wheat, potatoes, plums and pumpkins justifies vast outlays of time and money, it would be silly to waste time over an argument that it is worth while in the case of powerful drugs.

But I am sure that the Association is thinking of other things; you are asking not how the existing conditions ought to be changed but what we can do in the present emergency. How can the laws in force be administered, or modified if necessary, so as to accomplish their object? For the most part, I prefer to leave this subject to my official superiors, but there are several points which I feel like urging on the present occasion.

The first is that our states must not take a complacent view of the relations of the federal government to this work. There is the most urgent need of strenuous work in and by every state in the Union. Even if no mistakes were made, our market would still be flooded with adulterated goods. We have no right to reject any spurious, adulterated or defective article, nor any substance imported for use as an adulterant, if it is labeled accurately. This fact is being taken advantage of and large quantities of such things are being imported. The federal government may catch these articles in interstate transit, though various conditions render this extremely difficult. But suppose that the adulteration is practiced within a state and the articles are consumed there. The federal government is then quite powerless. In fact, a regular interstate business is done in the materials for adulteration, to be used in just this way. This statement refers more to foods than to drugs, but the fact of its being possible under the circumstances, is sufficient to call for some method of control. The only basis of such control is careful organization within the state. Fortunately, neglect of this matter will react against the neglectful community, which will become a dumping ground for the refuse.

In perfecting such state organization, the states cannot expect to rely upon the services of the federal employees. There is no desire to refuse such assistance; our government has always been exceedingly liberal in such matters, but all the government employees have more than they can do and are overworked. They would employ more assistants but cannot find competent ones. An unreliable expert may lead the government into

the most serious responsibilities by his mistakes, and such must not be employed. The states must find their own assistants.

One of the most important results of this situation is to show to pharmacists in the most remote parts of our territory the actual state of incompetence that exists in the matter of pharmaceutical testing, chemical and microscopical. Pharmaceutical education has been just as guilty of false pretense and fraudulent output as has drug purveying, and the present situation is going to show the necessity of the states' making suitable provision for the thorough education of inspectors and assayers, from their preliminary education up to their technical training.

Probably the next most important lesson is that of showing the very general incompetence of Boards of Pharmacy to pursue this work. The organization of these boards on the basis of political pull will result in failure that will become the more disgraceful the farther it goes. There is a great clamor at the present time to have this work controlled by pharmacists. The theory is correct, but the present conditions are not opportune. Pharmacy must fit itself for responsibility before the responsibility is entrusted to it. That it is doing this as rapidly as anyone could reasonably expect is very gratifying, but considerable remains to be done in this direction before even a near approach to a satisfactory condition can be made.

Let us now consider some of the specimens of adulterated goods, taking them up in a classified order.

Let us first consider a group of imperfections due to natural conditions presenting such great difficulties as to constitute an excuse of greater or less value. I have here a specimen of henbane leaves with an amount of sand caught within their folds, estimated at about 28 per cent. of the weight. The peculiar surface of henbane is such as to cause it to catch and hold sand and other earthy matters with great readiness. Very often the plant or its branches become broken down so as to rest upon the ground, in which case large amounts of such impurities are likely to be deposited upon them. This tendency is greater when the lower leaves, existing before the time of flowering, are collected, since these leaves rest almost directly upon the ground. This however is not the proper time to collect the drug. In the present instance, the amount of sand is larger than even these conditions would account for and there can be little doubt that a considerable quantity of it has been intentionally added.

Anise is another drug that is very apt to contain an excessive amount of sand, owing to the natural conditions of its production, and this is true of all fruits (so-called seeds) of its class. Nevertheless an Anise that contains 20 or 25 per cent. of sand has not been properly cleaned.

This cumin fruit contains stems and chaff to the extent of nearly 25 per cent. In this drug the stems are so heavy and hard to winnow out that an excuse may well be presented. Usually such stems can be sifted

out, but since cumin is a very long cremocarp, many short pieces of stem are likely to escape the sifting process. Nevertheless, in spite of these palliating circumstances it is evident that there must have been carelessness when 20 to 25 per cent. of such waste matter occurs in the drug.

This specimen of *Lactucarium* is mouldy through and through, and is unfit for use. The natural tendency of this drug to become mouldy in drying is very great indeed. With suitable apparatus this accident can be wholly avoided, but a great many small producers are not thus favorably situated. Mould usually exists upon the surface of the drug, but when it permeates the entire mass, as in this case, a preparation made from it becomes almost as much a preparation of mould as of *lactucarium*.

Here are some *Jambul* seeds which have been entirely hollowed out by worms and which are quite unfit for use. It is very difficult to exclude worms from this drug but once it has occurred the loss should fall at the place where it occurs, and no attempt should be made to pass it along upon some defenseless consumer.

This lot of *Belladonna* leaf consists to the extent of 50 per cent. of stems and fruits, while another contains 80 per cent. of stems. There is often an excuse for the presence of a moderate excess of stems in this drug but such an amount as here found must mean wrong intent. We know that the fruits of this drug are deficient in activity, but the medicinal quality of the stems is not settled. There is some reason to believe that all except the very large stems are equal to the leaves. The subject requires investigation and a possible broadening of our definition, but at the present time the definition includes only the leaves.

The second class of cases to be considered is that of drugs regarding which errors are for one reason or another quite likely to occur. It is not intended, on this account, to entirely excuse the distribution of such drugs to consumers. It is inconceivable that somewhere along the line the mistake should not have been detected, even in the present disgraceful state of combined ignorance and carelessness among dealers and handlers. We may however in order to free our indictment from every possible element of undue severity, separate these cases from those in which wrong intent is absolutely certain.

Five shipments of spurious *Matico* have reached New York within the year, against, I think, four of the genuine. The similarity between these two is very close indeed and a mistake, continued from collector to consumer, is quite excusable. I therefore exhibit mounted specimens of the two articles, and shall very shortly publish an exhaustive paper on this subject.

Several shipments of *spargula* or giant spurrey seeds have arrived as "*Asparagus* seeds," the case being one merely of confusion of similar names. It serves however to illustrate the carelessness of a system which allows the business to be conducted by people so lacking in education as to make and continue such an error.

Nigella, or so-called black caraway, labelled "Caraway," represents a similar confusion of names.

A lot of Japanese scopola is imported as "Scopola;" that is, as European scopola. So similar are these two plants that so high an authority as Holmes has questioned whether they do not represent a single species. Nevertheless, assay shows this particular lot to be very deficient in alkaloid.

Coto is one of the rarest, if not the very rarest, of important drugs. Parcoto probably stands next. The only genuine shipments of either that have reached this market within a year were two one-pound samples sent over by Merck & Company as a donation to the New York Botanical Gardens. Five spurious shipments have been offered and, although rejected by the Department of Agriculture some of them have afterward found their way into commerce.

Genuine soap bark is apparently becoming scarce, and several sorts, apparently different, though closely similar, are coming forward. No one knows anything about their identity or value. They may be superior to the original. There is great need of an investigation of this subject.

In the second class just considered, not only is the American dealer, and most if not all other parties concerned, freed from the direct charge of wrong intent, but the possibility of error is so great that he may be freed from all except technical responsibility, in most cases.

In the third class, now to be considered, there are also strong possibilities of genuine error, on the part either of the collector or the dealer, but yet the latter can claim no just freedom from responsibility. His error must have resulted from gross incompetence or gross carelessness, since means for detection are ample and convenient and such detection is specifically called for. There is, moreover, good reason to believe that in most of the cases such dealers have had a guilty knowledge of the facts.

The presence of henbane in stramonium and stramonium in henbane represents fraud on the part of the collectors. By dealers too careless to properly examine the drug carefully, this fraud might easily be overlooked.

During the past year, shipments of winter savory and of *Origanum onites* have both been offered as "thyme." They have the same odor and flavor, and probably the same composition and properties as thyme, but the substitution is improper and is easily enough detected by one who is interested. The last named plant has also been imported as marjoram.

Several different species of *Marrubium* are imported as horehound.

Dealers sometimes overlook the fact that tansy is defined as the leaves and tops, and offer the whole of the plant, entire or chopped up, an article that should be used only for distillation.

The year has seen an importation of Japanese aconite under the name "aconite."

Mylabris has once been imported as Cantharis. All that was necessary

was to re-label the article, in order to secure its admission. This indicates the necessity of watching for this article in powdered cantharides. The quality of mylabris is probably rather superior to that of cantharis and its use should probably be authorized.

In spite of repeated exposures, the worthless brown *Strophanthus hispidus* continues to arrive as "strophanthus." Its use in preparations is not nearly so general as a year ago, yet the fact that it can be bought in any quantity in all of our drug markets, shows clearly that many lives are continually jeopardized, and more or less of them doubtless lost, through this wicked fraud.

In the same class belongs the use of the spurious jaborandi, here exhibited. Persistent exposure has caused this article to nearly disappear, but it is still obtainable. This particular lot was not only labelled "Jaborandi," but underneath was the botanical name "*Piper jaborandi*," which was an additional act of misbranding, since the leaf is really a species of *Pilocarpus*.

It seems incredible that anyone should mistake the large woody rhizome, of unknown botanical origin, here submitted, for arnica root, but so it was offered at the Port of New York. It is very likely an *Inula* or a *Doronicum*.

The three lists already given include all the cases of spurious importations for which an excuse can possibly be found, notwithstanding that most of them represent fraud at some point in their progress. The following long list includes only acts which must be classed as intentionally fraudulent, not only at the point of origin but on the part of all handlers upon this side of the water. To this statement concerning "all handlers" an exception must be made in regard to the powdered drugs, which will be separately considered. If ignorance or error could possibly be claimed in any one of these cases, such a claim must be regarded merely as a pleading of the baby act.

Three shipments of the well-known worthless maracaibo bark have been imported as "cinchona," which is equivalent to calling them calisaya.

Two shipments of the worthless buds of *Populus monilifera* have come in as balm of gilead buds.

Nearly all the shipments of belladonna root of the past year have contained poke root, in amounts ranging from 15 per cent. to 42 per cent. Many of them have also contained scopolia, and several other and worthless roots have also been found. So general has been this adulteration of belladonna root that at one time nothing else could be found in our market, and there was danger that the manufacture of preparations of belladonna root would have to cease. The unprecedented action was then taken by the Treasury Department of permitting the poke root to be picked out from one large shipment and the belladonna to be utilized. This happy occurrence should never be lost sight of by American importers, since in my opinion it indicates a very desirable line of action for a number of forms of adulteration.

Dried scammony roots have long been used in Europe for the extraction of their resin, notwithstanding that this resin is required to be collected from the living root. Recently the additional step has been taken by manufacturers of importing a Mexican ipomœa root to be used for this purpose. Three shipments of this root have been received at New York, one labeled "jalap," the others "scammony root."

We have had a number of lots of benzoin in which chopped bark occurred in very large percentage, this and the sand present probably representing 40 to 50 per cent. of the entire weight. It is unfortunate that the Pharmacopœia does not fix a limit of impurity for this very important and expensive article.

One lot of benzoin was entirely spurious, being an artificial mixture.

Other artificial mixtures are commonly imported as balsam of Peru and occasionally as styrax.

Adulterated saffron has been on the steady decrease, yet many such shipments have been offered. A much more disgusting thing has been two shipments of calendula, heavily coated with mineral matter and colored to imitate saffron.

The offerings of lycopodium have been, on the whole, surprisingly good, though one lot was heavily adulterated with potato starch, and two lots with pine pollen.

Kamala adulterated with sand and with ground bark and sand, has been rather common. More unexpected was a lot containing a large quantity of our now familiar acquaintance, ground olive pits.

Broken senna, if clean and pure, is every whit as good as the finest whole leaf, and offers a good chance for the pharmacist to economize, since it can be bought much more cheaply. Senna siftings, on the other hand, are full of seeds, sand, pieces of wood and other impurities, and should be carefully distinguished as very inferior. Many lots of this latter article have this year been offered, labeled "broken senna."

As is known to most of you, Mexican sarsaparilla roots are marketed attached to a short piece of the rhizome. This rhizome we are directed by the Pharmacopœia to remove before using. So removed it is known as the "sarsaparilla butt." Several large shipments of these butts have been received from Germany and London, where the roots have been removed and used. Part of this was done in converting the Mexican Sarsaparilla into rolls to imitate and be sold for the higher priced Honduras Sarsaparilla. There can be no doubt that they were intended to be used here for making sarsaparilla preparations.

Here is a shipment of quince seeds consisting quite largely of small fragments of very young quinces chopped up and dried, and possessing, of course, none of the mucilage that gives to quince seeds their value.

Three lots of spurious arnica flowers, evidently the flowers of *Inula britannica*, have been offered for import.



We have had two shipments of *Cannabis indica*, grown in Africa, and several which were spoiled in curing. One other lot consisted largely of fruits or so-called seeds.

Probably the most important and interesting of all the year's experiences has been the importation of three shipments of *Hyoscyamus muticus* as "henbane." This is a very large plant, collected in Egypt so cheaply that a ton of it can probably be obtained at less cost than a hundred-weight of good henbane. Whereas henbane contains but one-twelfth of one per cent. of alkaloid, this species contains often more than one per cent., and even up to one and a-quarter per cent. This alkaloid being all hyoscyamine, substitution is unpardonable. Remembering the difficulty of getting henbane that will assay up to the requirement, you will see how useful this article would be for the purpose of adding in suitable amount to an inferior henbane to make it appear to conform to the standard. As a matter of fact I have actually found it so employed in powdered henbane.

This lot of inferior lavender flowers, dyed a beautiful blue, is of great interest.

Spurious buchu have been very common, and I am led to say that I consider one of the most important duties of the Committee of Revision of the U. S. P. to be to undertake a careful investigation of the composition and properties of the several buchu. I have always regarded the evidence on which long buchu was driven out of use as very inconclusive, and many practitioners of medicine specify it by preference. It is not unlikely that all the varieties are practically equal in value.

The importation of buchu consisting largely of stems is a different matter. Very small, thin stems are perhaps as useful as the leaves, but 23 per cent. of thick, woody stems, which we have found in buchu, is entirely improper. This subject of the character and limitation of stems in buchu also requires treatment in the official definition.

We have received one shipment of charlock seeds labeled "French Mustard Seeds."

A lot of "Cut Dandelion Root" was found to consist of the bark trimmings from chicory. Cut dandelion root containing small stones has already been referred to.

The same kind of stones there found have also been used to load anise to the extent of 28 per cent.

Since every form of tobacco is subject to a duty, it was very clever to import the large leaves of *Nicotiana rustica* as "Russian Mullein Leaves."

Rhubarb is sometimes subject, for reasons unknown to me, to being soft, spongy, and of inky blackness in the interior, rendering it apparently almost worthless. I have seen a large shipment of 155 cases consisting of half of this, the rest of good roots, the two being perfectly intermixed. Since the external appearance was about the same in both, there was no way of separating them with certainty except by chopping every piece in two.

My account of the entire drugs will close with reference to a large shipment of *nux-vomica*, consisting largely of small worthless seeds which had been rolled in some mixture of clay, probably clay mixed with the pulp of the *nux-vomica* fruit, so that it adhered in layers and finally brought the seeds up to the average size and weight ; a very clever sort of adulteration that would have passed undetected except by such very careful inspectors as are employed in New York.

Regarding the powdered drugs, there is little to be said beyond submitting the list, and allowing the members to form their own conclusions. In the case of anise containing 25 per cent of sand, belladonna containing poke root, and *digitalis* containing stramonium, the defect in the powder was probably inherited from the whole drug, and the miller may have been guilty only of carelessness ; but when we find three cases in which gentian contained 50 per cent. of fiber, and another in which it contains a large percentage of olive pits, two lots of turmeric containing wheat-starch, three lots of *colocynth* having the seeds ground with the pulp, henbane containing *hyoscyamus muticus*, five lots of belladonna root containing from 30 per cent. to 50 per cent. of olive pits, *ipecac* with the same amount of the same adulterant, white agaric, *euphorbium* and gamboge with 25 per cent. of cornstarch, sage with 50 per cent. of the same, *conium*, *asafetida*, and *santonica* heavily adulterated with exhausted birch bark, and licorice, consisting of the bark peelings from Russian licorice, there is but one statement that fits the case ; each and every one of the drug millers represented by these goods deserves to be put behind the bars for a good long term of years.

I need hardly add that it is among the State Boards and State Commissioners that the principal work in the examination of powdered drugs is to be performed, for it is this form of the drug which comes closest to the consumer.

In conclusion, I have two questions to submit to the good judgment of the members of the Association.

First.—Should not every member of a Board of Pharmacy and every food and drug commissioner, state as well as federal, be compelled to undergo a special and searching examination, far broader and more searching than that for the license of pharmacist, and be specially licensed for the work, and then receive a salary commensurate with the responsible position that he has to fill, and with the time and expense involved in fitting himself for it.

Second.—How much confidence should be reposed in the representatives of commerce in the establishment and emendation of drug standards, in view of the showing made by these importations of the past year. There has recently been a strenuous demand from various directions that commercial men should be given a strong influence in the framing of the definition and standards of our next pharmacopœia. Surely, advice and

assistance from such sources should be earnestly sought, but that authority should be vested in them, in view of present trade conditions, appears to me to be a monstrous suggestion. For many years past a few of us have labored strenuously in this Association to bring to the members a knowledge of the evil conditions actually existing in the wholesale drug trade. As you all know, we have been met by repeated, persistent and strenuous denial, much of it taking a form that was anything but complimentary to the knowledge and judgment of those presenting the facts. To awaken an interest on the part of the members of the Association, to secure the establishment of conditions that would lead to investigation and determination of the facts, to gradually promote a general knowledge of those facts, and to finally submit such conclusive and even indisputable evidence as that upon this table, has been not only a gradual but a very painstaking process, in the face of the commercial opposition to which I have referred. This commercial opposition has laid great stress upon the claim that it and it alone occupied a position of thorough knowledge of the case, and that opposition to its statements should not be trusted. If this claim as to knowledge is well founded, then this commercial opposition must have been one of guilty knowledge. If on the other hand, it could so greatly err in reaching just conclusions; in spite of its vantage ground of superior opportunity, it is thereby condemned as unfit to be trusted with the guidance of drug standards and their administration.

The report of Mr. Rusby was greeted with applause.

The Chair called for action, and Mr. Ladish moved to receive and refer to the Committee on Publication.

The Chair announced that the paper was before the Convention for discussion, and that the thirty or forty drug samples that Mr. Rusby had sent from New York City would be left on the table during the day. They were very interesting, he said, and he invited the members to take a look at them before leaving the room. He stated that the report of the Committee on Drug Adulteration was also open for discussion.

Mr. Francis said this report of Mr. Rusby dealt with a very interesting and important subject to all who are engaged in any branch of pharmacy. He could not speak from Mr. Rusby's point of view, or that of the importer of drugs, but from the viewpoint of the consumer he could endorse a good many things Mr. Rusby had said. He wanted to say in this connection, however, that Mr. Rusby had, much to his surprise, overlooked one of the most important parts of this subject, the part that was the most flagrant, so far as quality is concerned; and that was the character of our domestic drugs. Mr. Rusby's whole argument was as to imported drugs. It was really harder to get good native drugs, Mr. Francis said, of the proper quality than imported drugs. This was due to the fact that the

importer of drugs had to run the gauntlet of the inspector of the port of New York and other ports of entry ; and furthermore, the drug trade has been worked down to a better system as to foreign than as to native drugs. The manufacturer purchases almost all of his native drugs by sample ; and while the sample submitted by the native collector may show the drug to be of the proper identity and quality, in many instances they send drugs that are absolutely misleading, and yet do it in good faith, through ignorance. In the second place, a shipment may be an admixture of closely related species. Third, a very serious objection is the fact that the native drug, in many instances consists largely of parts of the plant that are undesirable ; drugs which should consist of leaves and tops will have an over-percentage of stems, and sometimes native drugs which should consist of roots, consist largely of stems. In many cases it is so difficult to obtain the native drugs in sufficient quantity that the manufacturer has to buy at the market price and then resort to a system of hand-cleaning, thereby reducing the drug thirty, forty, or even fifty per cent. in weight.

The mention of asafetida by Mr. Kebler in his report is an old sore spot. He desired to again present an idea he had presented many times before, and that was, that the proper thing to do is to base your formula on the use of purified alcohol-soluble resin, made by extraction with ninety-five per cent. alcohol. Having obtained a commercially-pure resin, it is then a very simple matter to use the proper proportion of this in the manufacture of fluidextracts, pills, tablets, whatever it may be, and in that way the proper quality may be obtained, regardless of the original assay of the asafetida.

Another matter that he thought might be of much interest was cannabis indica. The procuring of cannabis indica of proper quality has been a very difficult matter for many years. It is not necessary to discuss why it is difficult to get a pure cannabis indica of proper quality. Another feature is its very great cost in the last few years, owing to the imposition of a very high duty by England. It is possible to obtain in the United States American-grown cannabis indica, equal in all respects to the imported, and at a very much cheaper price ; in fact, he said, it can be very easily obtained here.

Scammony ; Dr. Dohme was going to deal with this subject recommending the use of the American drug, and giving it official recognition. He said he had had about five tons of Mexican scammony on hand for several years and didn't know what to do with it.

Lupulin : Very little is said in this report about lupulin. The Pharmacopœia requires that lupulin shall yield a certain per cent. upon extraction by ether, a very good test, and places the maximum percentage of ash at ten. He said the gentlemen present might have been more fortunate than he, but nineteen out of twenty samples he had obtained in the last

two years had contained more than ten per cent. of ash. Most of it was brought from foreign countries. He said that whereas the ordinary lupulin of commerce could be obtained for about fifty cents a pound, and sometimes considerably cheaper than that, it was very difficult to find a foreign importer who would guarantee the U. S. P. article as regards ash at less than ninety-five cents a pound, this figure not to include freight, etc. He did not know whether the Pharmacopœia was too high as to ash, but he thought the matter was worthy of more investigation.

**Pilocarpus:** About five years ago it was difficult to obtain any genuine pilocarpus, but during the past twelve months it has been comparatively easy to obtain a supply of the genuine drug.

There has appeared in New York recently a powdered acacia ; whether a spurious acacia he did not know, he had not been able to decide as yet. He did know, however, that some dealers on the New York market supplied a substance known as powdered acacia, which did not exactly test up as pure acacia should do. He did not think it could be regarded as a genuine gum, but thought perhaps that it consisted of some closely related gum, imported from Africa ; just what it was he had not yet been able to determine. It could be sold much cheaper in powdered form than standard acacia could be.

Mr. Francis said that there were a number of other things that he could speak of but he knew this paper was going to call for a lot of discussion, because it was very interesting, so he would not consume any further time.

Acting Chairman Vanderkleed stated that in regard to the point made by Mr. Francis that Mr. Rusby's paper omitted discussion of native drugs, he would call attention to the fact that his paper was limited by its title to "Crude and Powdered Drugs at the Port of New York," that it was only intended to cover imported drugs at that port. He thought Mr. Francis' remarks in regard to the difficulties encountered in dealing with native collectors of drugs were entirely appropriate, for the reason that undoubtedly the foreign collectors of drugs went about it in very much the same way as collectors do in this country, and the fact probably explained why a great deal of difficulty with imported drugs obtains at our ports.

Mr. Sayre said Mr. Kebler had referred to the work of a member of the Laboratory staff, and suggested that the Section would like to hear from this gentleman.

The Chair said that if the remarks of the gentleman could be construed as along the line of discussion, the Section would be glad to hear from him at this time.

Mr. L. D. Havenhill responded, and said that at this time not very much was known about copaiba. We know that something is imported from South America that is called "copaiba," and it comes labeled as "Maracaibo" copaiba, and "Para" copaiba, and with names of various

other ports of shipment. His investigation showed, however, that there is nothing distinctive, at least chemically, in these titles. Perhaps the most variable one that we have is "Maracaibo" copaiba. The "Para" copaibas are perhaps more uniform, but as a class they are excluded by the Pharmacopœia test. This is very interesting, as they run high in oil, which he understood to be the essential constituent of copaiba.

As to the gurgun balsam test as it now exists, you can put at least 25 per cent. of gurgun balsam in a good copaiba, and it will not give the coloration the Pharmacopœia requires. But it does give a brown coloration which may be developed in three minutes and will respond to the Pharmacopœia test. So, therefore, we cannot exclude the copaibas which come in from South America, even if they give the original test for gurgun balsam, as it has been previously found that they will not give the modified test as found in the Pharmacopœia. Until we have more investigation on the subject of copaiba we can do little about it, unless the Pharmacopœia Committee chooses to make an arbitrary standard, and say that certain copaibas are official and all others are not—something it has not seen fit to do.

Mr. Asher told of a specimen of black pepper to which his attention had been called, received at the port of New Orleans and adulterated with forty per cent. of sand and portions of the undried fruit which has been gathered with it. It had been imported as "Pure Pepper."

Referring to the remarks of Mr. Francis on the powdered acacia that he had not been able to identify, Mr. Asher suggested that it was probably an "emulsion" acacia, which is sold to manufacturers at a price very much cheaper than the genuine acacia.

Mr. Forbes, referring to Mr. Rusby's paper, related an experience to show where the seller and importer are sometimes entirely innocent of the adulteration of drugs. At one time he had sent an exceptionally fine quality of malt to the millers to be ground, and when it came back and he emptied it into the bin he found lumps of mould in it as big as his fist. He found afterwards that the same miller had been doing the same thing before; he had on hand large quantities of ground malt, and he had taken his malt and put it away in other sacks, and had given him this mouldy malt instead. If he had taken the precaution to run it through the mill, he might never have discovered the deception. And so he thought it might very often happen in that way, that a manufacturer would send his goods out to the mill and not get back what he sent.

Mr. E. G. Eberhart, of Indianapolis, thought that in many instances it was extremely difficult for the manufacturer to obtain material in the open market of sufficient purity and sufficiently high quality to make his products such as he would like to make them. For instance, just at this time, it appears that a great deal of belladonna leaf on the market is adulterated with scopolia, and he hoped if "Uncle Sam" could do anything to better

conditions he would increase his vigilance and keep out such products as are brought in adulterated, and which frequently glut the market, almost to the exclusion of the better kind.

Mr. Hynson, referring to the remarks of Mr. Francis about asafetida, said that he sometimes got things mixed. He hoped Mr. Francis did not mean that anything labeled "asafetida" might be brought into proper form for use by simply extracting with alcohol. He was afraid some of the members might have misunderstood him on that point, and go ahead and buy anything that they could upon the idea that it might be purified by treating it with ninety-five per cent. alcohol and get a reliable product. Of course such substances might be adulterated with alcohol-soluble material—just as with stones and rocks.

As to Boards of Pharmacy, he had no doubt that Mr. Rusby meant that they should be sufficiently educated to test the applicant as to his ability to investigate drugs, but here it looked as if he put the members of the Boards of Pharmacy on the plane with drug inspectors, with the requirement that they should have the qualifications of a drug inspector. Many pharmacists believe that the specific duties of the members of a board of pharmacy should be to test the applicant as regards his ability to practice pharmacy, pure and simple.

Mr. Arny thought too much stress could not be laid on the suggestion of Mr. Rusby regarding the requirement of persons charged with the supervision of drugs entering the ports of the United States. Mr. Rusby had spoken of the fact that they were having a very careful examination of drugs entering the port of New York, but that the importer could bring in his spurious or adulterated drugs through some of the smaller ports, where examination was not so strict. In many cases those in charge of smaller ports are incompetent. He knew of a case where the inspector of one of the smaller ports was a homeopathic physician. In another case a prominent young physician was appointed, and when the young gentleman retired from the service there were about forty nine physicians applying for the place, and the one that obtained it was a nephew of the appointing power.

He really believed this Association should take some action in this matter. Of course it cannot legislate, or anything of that kind, but Mr. Rusby's point is well taken; there should be uniformity in regard to this matter. What is the use of New York having a rigid examination, for instance, and then allowing these adulterated drugs to slip through the smaller ports?

Mr. Mayo said that Mr. Arny's suggestion that something should be done under this particular head was a very apt one, and he thought it eminently fit that the American Pharmaceutical Association should take a strong position in this matter. He, therefore, moved that the Section on Scientific Papers ask the Association in general session to request the proper

authorities to take such steps as might be necessary to bring about an absolute uniformity of requirements for the admission of drugs in all the ports of the United States. This motion was seconded by Mr. Army and Mr. Eberhardt.

Mr. Hynson suggested that this might be coupled with the resolution offered in the Legislative Section touching the introduction of coca. Mr. Mayo agreed that it might go in at the same time.

Mr. Hays said that, without knowing anything about the facts, he would suppose that the same regulations did prevail throughout the United States, but the question was as to their enforcement. He thought that the Association might request the Treasury Department to appoint men that would see that these regulations were properly enforced.

The Chair said that in order to get the motion definitely before the Section, he would state that it had been moved and seconded that the Scientific Section request the General Association to take measures or request the proper department at Washington (which would be the Treasury Department, he believed, not the Department of Agriculture) to make and enforce uniform requirements for the entry of all drugs throughout the United States. He asked if there was any further discussion of the motion before the house.

Mr. Asher said he believed that if a motion of this sort was passed and presented to the proper party it would not receive much weight. He believed the clause should be inserted, "Whereas, it has come to the attention of the American Pharmaceutical Association" that such conditions exist, "therefore, be it resolved," etc. That would be the proper way to put it, he thought.

Mr. Mayo accepted the amendment, and said the motion would read this way; that the matter be brought to the attention of the proper authorities, and that they be requested to take such steps as might insure uniformity in the quality of drugs imported at the different ports of the United States, and that the Secretary of the Association be directed to send with this resolution a copy of the paper submitted by Mr. Rusby as the basis for this request.

Mr. Army seconded the motion.

The Chair said that the motion carried with it the understanding that the General Session would make it in the form of a resolution. Mr. Mayo said he would submit a resolution to that effect.\*

Mr. Kebler suggested that all this had been done already. He said that the Government now had men at every port in the United States to look after this matter. The Agricultural Department examines all drug products. The Treasury Department re-ships them, if found not to conform to the standard of the other Department. He said he wanted to make a

---

\* See page 536.



statement of the situation, to show exactly what could be done. Any drug that comes into the port of New York, Boston, Philadelphia, New Orleans, Detroit or Seattle, whether the drug is good or bad, is forwarded to Washington for investigation.

Mr. Mayo said that this motion was made upon the supposition that Mr. Rusby's paper indicated an existing condition of things. If Mr. Kebler says it does not exist, then it would be an anachronism to have such a resolution passed, based on conditions which have heretofore existed, but which do not now exist.

Mr. Kebler, continuing, said that if an importation of belladonna root, for instance, is imported at New York in bond, and then shipped to some small inland town, this condition could be met by keeping track of such importation in bond. He said the regulations at all the ports were the same.

The Chair stated that in view of the fact that the motion, if carried, could work no hardship on any one, if the conditions were as suggested at the various ports of entry, he would put the vote on Mr. Mayo's motion, unless he saw fit to withdraw it.

Mr. Hays called attention to the fact that Mr. Rusby's paper had reference only to crude drugs entered at the port of New York during the year 1907-8.

Mr. Mayo said he thought his resolution or motion should stand, in the light of Mr. Kebler's subsequent modification of his statement.

Thereupon the Chair put the vote upon the motion as stated, and it was adopted.

Mr. A. H. Clark said he would like to make a few remarks in regard to crude drugs in Chicago. During the past year and a half, he said he had examined quite a number of these drugs, with the following result:

Out of five samples of Jalap examined, three were above the old standard of 8 per cent. of *extractive*. One was as low as 4, and the other about 5. These two samples, it was interesting to notice, were received about a month or so after the Pure Food and Drugs law went into effect. Since that time they have gradually been increasing in strength, and it is easy to-day to get this drug up to the standard.

As to asafetida, he had examined four samples of powdered asafetida, having nothing to do with the crude article. One sample, received about fifteen months ago, contained 14 per cent. of alcohol-soluble matter; another sample received a few months later, about 20; another sample received about four months ago, between 30 and 35 per cent. and one sample received a week ago contained over 50 per cent. of alcohol-soluble matter. The ash of the first three samples received,—the first a year or more ago,—ran as high as 60 per cent. and the last sample 26 per cent. It is interesting to note the gradual improvement in quality since the Federal Food and Drug Act went into effect.

Guarana : Two samples were examined, both assaying over 4 per cent. of alkaloidal principles.

Nux vomica : Out of eight samples, only one has been below the standard of  $1\frac{1}{4}$  per cent. of strychnine.

Stramonium : Two samples were found above standard, and one was a spurious one, the drug being entirely different ; was not stramonium at all. His own examination did not reveal what it was.

Henbane : Three samples ; two up to standard, one far below.

Hydrastis : Out of fifteen samples, just one was below the standard of  $2\frac{1}{2}$  per cent. and that was received about a week ago. Twelve specimens were above 3 per cent., and one  $4\frac{1}{4}$  per cent.

Ipecac : Out of nine samples, all were above the present standard of 1.75 per cent., but four were below the old standard of 2 per cent.

Aconite : Two samples were examined, both up to the standard.

Belladonna leaf : Two samples, both above the present standard of 0.3 per cent., but both below the old standard of 0.35 per cent.

Coca : One sample of coca leaves examined ; it was found above standard.

Colchicum corm : Four samples were examined, and all were above standard save one.

Colchicum seed : Of two samples, one was above the old standard of 0.55 per cent., and the other far below even the new standard of 0.5 per cent.

Cinchona : Five specimens examined ; all above the standard. One specimen contained over 9 per cent. of total alkaloids.

Mr. LaWall said that inasmuch as reference had been made to various ports of entry and nothing said specifically about Philadelphia, he would say that at that city goods were being examined along the line of Mr. Rusby's paper and were re-shipped when they did not come up to the Pharmacopœia requirements, which often happens. In the past year they had re-shipped about 5,000 pounds of henbane and forty-odd cases of asafetida and belladonna root and other drugs of that character, and while the imports are not nearly as heavy as in New York, still their work is being done along that line as thoroughly as can be.

The Chairman, speaking with regard to henbane, said it seemed that at the present time there is trouble in getting henbane that would assay up to .08 per cent. required by the pharmacopœia. It is evident that many importers are getting henbane that does not test fully up to the standard of .08 per cent. ; but unless the lower products are allowed to come in, the manufacturers would probably have nothing to make their extract and fluidextract of henbane from.

Mr. Kebler said that Mr. Francis spoke about domestic drugs being of poor quality in many cases or mixed in various ways. The department

believed that the first thing to do, under the new Pure Food and Drugs law, was to protect the people of this country from imports from abroad, and that was the principle the department had acted on. They have said nothing about domestic drugs as yet, because they are under investigation and the department was in no position to say anything definite at present. It has, possibly, a thousand of these drugs under investigation at the present time, and the results will be published in time.

Lupulin comes in under peculiar conditions. There is no trouble in getting it in of proper quality, and that which comes in of impure quality and with a large percentage of ash is used for pyrotechnics. He said the department did not exclude these things, but required the importer, if he was a man of good character, to file a bond and give an affidavit that it was to be used for technical purposes as represented. In some cases it is not permitted, but where they have reason to believe the manufacturer was honest they gave him that relief. Whether they abide by it or not they cannot tell, but they intend to follow these things up. If they do abuse the trust of the Department, they will probably come to grief in time.

Importers of the better type are very anxious for the government to examine the drugs that come in, and if they are not what they ought to be to keep them out. They are heart and soul in this matter. In a case the other day a sample was first found to be all right, but further analysis showed it to be a little low. The importer didn't want to keep it, and wanted to know if he could not re-ship it. They had bought it, and they had it on their hands. That was a case of where the importer was desirous of having the law enforced.

As to the acacia question, he said the department had been on the track of that for about two months, and was trying to work it out.

On the subject of properly qualified men to do the work, Mr. Kebler said that they checked almost everything in Washington, but it was difficult to get enough men to do the work who were properly qualified, with the remuneration that they had at their disposal to offer. He said a great many teachers had the idea that they should allow young men to go out when they were not fully equipped for this work. He wanted to make a plea for the young man on the educational feature. He earnestly advised that he should not take a short or inferior course, because, even if he goes through on examination, he will get a low mark, and get a position accordingly, and he is dissatisfied. He will never be satisfied with the compensation he gets or the work he gets, and his advice to teachers was to encourage a young man to take a thorough course, so as to enable him to go out and feel like a man and stand up and face anything that comes along.

The Chair stated, that, without objection the paper of Mr. Rusby would be accepted and referred for publication.

The General Secretary suggested that this paper be placed in the hands

of the Publication Committee, with permission to consult with Mr. Rusby in regard to any slight changes that he might wish to make in it. The Chair stated that he happened to know that Mr. Rusby corrected his own proof of the paper, but whether he had corrected the second page proof or not he was not certain. But even in case it had been, it was best to submit it to him before publication.

And so this matter was passed.

The Chair called for the nomination of officers for the ensuing year, and said that a Chairman, Secretary and Associate on a Committee were to be named.

Mr. England nominated Mr. Charles E. Vanderkleed, of Philadelphia, for Chairman, and this nomination was seconded by Mr. Hallberg.

Mr. Puckner said that last year the presiding officer of the Section was absent from the meeting, and Mr. Vanderkleed presided, and this year it was the same way, and he hoped the Section would now reward Mr. Vanderkleed for his efficient services, and he, therefore, heartily seconded the nomination of that gentleman for Chairman of the Section for the ensuing year. Mr. Hays suggested that the only objection to having Mr. Vanderkleed was, that it seemed the Chairman of the Section was always absent, and it would be unfortunate to be deprived of Mr. Vanderkleed's presence next year.

The Chair called for other nominations for Chairman, but none was offered at this time.

Mr. Koch nominated Mr. A. H. Clark, of Chicago, for Secretary, and several members seconded the nomination. Mr. Charles E. Caspari said he wanted to put in nomination a gentleman who had frequently been nominated before, but for some reason or other had never been able to accept a position in any of the Sections. He believed the conditions were changed now, however, and he desired to put in nomination Mr. M. I. Wilbert, of Philadelphia, for Secretary of the Scientific Section for the ensuing year. This motion was seconded by Mr. Hynson, of Baltimore.

The Chair called for nominations for Associate on the Committee, but the General Secretary suggested that it was customary for the Chairman and Secretary to name their associate on the Committee, and Mr. Puckner said that the By-Laws so provided. The Chair said he stood corrected.

The Chair here had distributed among the members the three papers left from the morning session, the authors of which were not present, and which, according to the By-Laws, were to be read by title only, for that reason. He said the first was a paper on *Calycanthus Glaucus*, by H. M. Gordin and that this was a continuation of this writer's interesting and valuable work on the alkaloid of this plant. The second was a paper on Oil of Sandalwood, by A. R. L. Dohme and H. Engelhardt, of Baltimore, and the Chair invited attention to the abstract of this paper as published

in the program. The third was a paper on the Purity of some Official and Non-Official Drugs and Chemicals, by the same authors. The full text of these papers here follows :

#### ON THE CRYSTALLINE ALKALOID OF CALYCANTHUS GLAUCUS.

BY H. M. GORDIN.

Third Paper. On Isocalycanthine, isomeric with Calycanthine.\*

In previous papers † I have shown how to extract calycanthine from the seeds of *Calycanthus glaucus* and prepare the usual salts of the alkaloid. It was shown that calycanthine contained half a molecule of water of crystallization which was removable by heating the alkaloid to  $120^{\circ}\text{C}$ ., that the anhydrous alkaloid had the formula,  $\text{C}_{11}\text{H}_{11}\text{N}_3$ , and that the formulas of all the salts, of which a considerable number were prepared and analyzed, corroborated this formula.

Having exhausted all the material I had on hand, I ordered a new batch of seeds from the same dealer and worked them up by exactly the same method as was used for the first batch. But while both batches of seeds looked exactly alike, and the alkaloid prepared from the second batch looked exactly like the calycanthine I obtained from the first, it very soon became evident that the two alkaloids from the two batches were not identical in every respect. While the calycanthine from the first batch melted hydrated at  $216-218^{\circ}$  and anhydrous at  $243-244^{\circ}$ , and the water of crystallization was removable by heating the alkaloid to  $120^{\circ}$  for a few hours, the second alkaloid which also seems to contain solvent of crystallization, melts at  $212-214^{\circ}$  and cannot be heated even to  $110^{\circ}$  without partial decomposition, as indicated by its becoming yellowish and then melting indefinitely between  $105^{\circ}$  and  $110^{\circ}$ . That the second alkaloid also contains solvent of crystallization is shown by its gradually losing weight when kept in vacuo over a good drying agent. What the nature of the solvent of crystallization is, I cannot say as yet. That it is not water alone is indicated by the yellow color the sulphuric acid assumes when this drying agent is used. Most probably it is either acetone alone or a combination of acetone and water. The exact amount of solvent of crystallization in the second alkaloid I have not yet been able to determine, for the reason that at ordinary temperature in vacuo the loss per day soon becomes so small that, unless several grams of alkaloid be taken for a determination, the balance soon ceases to indicate any change in weight during 48 hours. Thus while the loss during the first 72 hours amounted in one case to one and a half per cent., the loss during the next 48 hours

---

\* Messrs. Eli Lilly and Company deserve great credit and my heartiest thanks for working up for me a large quantity of *Calycanthus* seeds and exercising special care in the preparation of the extract.

† Proc. Am. Ph. Assoc., 1904, 345; 1905, 224. J. Am. Chem. Soc., 27, 144 and 1418.

was only about one-tenth of a per cent. Hence if only 0.1 or 0.2 grams be taken for a determination the balance would soon indicate apparent constancy of weight. For this reason I have so far not been able to make combustions of the second alkaloid. I have been keeping several grams of it in desiccator over phosphorus pentoxide for nearly two months, but the alkaloid still keeps on losing weight. Attempts to analyze the air-dried substances gave discordant results, owing probably to varying amounts of solvent of crystallization going away even at ordinary temperature. I intend to try quicker methods of drying later on.

While waiting for the alkaloid to dry out I prepared and analyzed several of its salts. It was found that while most of the salts of the second alkaloid differed in melting-point and amount of water of crystallization from the corresponding salts of the first, the base underlying them all had the same formula as the anhydrous calycanthine obtained from the first batch, *i. e.*,  $C_{11}H_{14}N_2$ . I have, therefore, named the second alkaloid *isocalycanthine*. Judging from the crystallographic measurements made by Prof. Kraus isocalycanthine is identical with the alkaloid investigated by Dr. Wiley in 1896 (Drugg. Circ. 1896, 55), but as the rotation and melting-point given by Wiley ( $219^\circ$ ) differ from the rotation and melting-point of isocalycanthine, Wiley's alkaloid described in the quoted article was probably impure isocalycanthine. Still another alkaloid was described by Wiley under the name of calycanthine in a previous article (Am. Chem. J., 1899, 557). This alkaloid also seems to have been different from the calycanthine I obtained from the first batch as well as from the isocalycanthine I obtained from the second batch of seeds. It would be interesting to measure crystallographically the calycanthine I obtained from the first batch, but having been promised a liberal supply of seeds and never suspecting that the alkaloid from the second batch would turn out to be different from that of the first batch, I used up all of the first alkaloid in preliminary experiments. Whether the seeds yielding the different alkaloids, while looking alike, nevertheless belong to different species of the plant, or the differences are due to a difference in the age of the plant at the time of the collection of the seeds, I shall try to determine later on.

The isocalycanthine was prepared by exactly the same method as described in my first two papers on the subject. Most of the salts of isocalycanthine were also prepared by the methods given in those articles. For the preparation of the hydrochloride and the hydrobromide it was found necessary to use pure acetone (Meck's medicinal), these salts being considerably more soluble in commercial than in pure acetone. For the nitrate a slight modification of the former method was used.

#### EXPERIMENTAL.

Air-dried isocalycanthine melts at  $212-14^\circ$ . It is easily soluble in ac-

tone and pyridine, more difficultly in ether, almost insoluble in benzene, and insoluble in petroleum ether. A saturated solution in alcohol, prepared by shaking excess of finely powdered isocalycanthine with alcohol in a mechanical shaker for eight hours, contained 1.4 grams in 100 Cc. A saturated solution in water, prepared by the same method at the same temperature, contained 1 part in about 6000 parts of solution. In both cases the residues left after evaporating the solvent were not dried to constant weight, but kept at 80° for three hours and then in desiccator for one hour. The saturated aqueous solution of isocalycanthine gives no turbidity with Mayer's reagent unless acid be present; with Wagner's reagent turbidity appears even in absence of acid.

A solution of 0.1555 Gm. of air-dried alkaloid in 25 Cc. alcohol gave at 23.5° in a 200 Mm. tube of a Josef and Jan Fric apparatus a rotation of 8.27. Hence  $[\alpha]_D^{23.5} = 664.36^\circ$ .

A solution of 0.4069 Gr. in 25 Cc. acetone (from bisulphide, Merck's, and redistilled by myself) gave in the same polariscope at 24.5° a rotation of 22.55°. Hence  $[\alpha]_D^{24.5} = 692.89^\circ$ . The rotation of isocalycanthine is, therefore, exceptionally high. So far as I know the alkaloid is surpassed in this respect only by some members of the sentonide group.\*

On prolonged exposure to the air, isocalycanthine becomes yellowish. The color reactions so far examined seem to be identical for both alkaloids. An attempt to determine the molecular weight of isocalycanthine by titration with standard hydrochloric acid, using hematoxylin as indicator, gave unsatisfactory results, the end reaction being very unsharp. Other indicators were not tried.

Following is a report on the crystallography of isocalycanthine by Dr. E. H. Krauss:

"The crystals of isocalycanthine which were subjected to a crystallographic examination were obtained by slow crystallization at room temperature from a solution in hot alcohol. They are rather small, the largest being about 2 Mm. in length. The crystals are clear, colorless and transparent, and possess high refractive power. For the most part the crystals are well developed, the faces being bright and affording excellent images.

From the angular measurements of the crystals and the form and position of the etch figures on the basal pinacoid, the crystals must be referred to the orthorhombic bisphenoidal class. Crystals showing an unequal development of  $p(111)$  and  $p'(1\bar{1}1)$  were, however, not noted. In general the following forms are to be observed:  $p(111)$ ,  $p'(11\bar{1})$ ,  $m(110)$ ,  $q(011)$ ,  $c(001)$ , and  $a(100)$ . Of these forms the basal pinacoid,  $c(001)$ , is usually the predominating form, giving the crystals a more or less tabu-

---

\* Nasini, Atti Acad. Lincei (3), 13, 1882. It would be interesting to know the rotation of calycanthine from the first batch of seeds, but as I did not have a polariscope when I started to work on the subject, the determination of the specific rotation was postponed. In the meantime all the calycanthine was used up.

lar habit. The forms,  $p(111)$  and  $\bar{p}(\bar{1}\bar{1}\bar{1})$ , are, as already said, about equally developed and always give brilliant images. The brachydome,  $q(011)$ , occurs as small narrow faces truncating the edges of the forms  $p(111)$  and  $\bar{p}(\bar{1}\bar{1}\bar{1})$ . The other forms [unit prism,  $m(110)$ , and macropinacoid,  $a(100)$ ] are for the most part small and not always to be observed. Figure 1 shows the above-mentioned forms in combination. In all six crystals were measured.

In March, 1896, W. H. Melville \* described the crystallography of some crystals of an alkaloid obtained by Professor H. W. Wiley from the seeds of *Calycanthus glaucus*. Although Melville's description is not as accurate as it might be, his values obtained for the elements of crystallization are of interest in that they show conclusively that the calycanthine prepared by Wiley must, from the standpoint of crystallography, be considered identical with isocalycanthine. This is clearly shown by a comparison of the values obtained by Melville and myself.

Crystal system.....Orthorhombic.  
 Crystal class... ..Bisphenoidal.  
 Axial ratio,  $a : b : c$ , 1.2557 : 1 : 1.3226 (Kraus).  
 Axial ratio,  $a : b : c$ , 1.2490 : 1 : 1.3260 (Melville).

Calculated.		Observed.	
		Kraus.	Melville.
$c : p$	$(001) : (111)$	59 24'	59 34'
$c : q$	$(001) : (011)$	52 54	
$a : m$	$(100) : (110)$ 51 28'	51 35	
$p : p'$	$(111) : (\bar{1}\bar{1}\bar{1})$ 84 39	84 39	84 34
$p : q$	$(111) : (011)$ 32 25	32 33	32 35

Melville states very distinctly that the development of the crystals did not reveal any of the hemihedral forms of the orthorhombic system, which also holds good for these crystals. But since both isocalycanthine and the alkaloid examined by Wiley possess a very large rotation of the plane of vibration, it was thought well to determine the symmetry as revealed by the etch figures. Hence, several crystals were etched by allowing cold alcohol to act upon them for a few seconds. The figures obtained on the basal pinacoid clearly showed by their form and position that the crystals must be referred to the orthorhombic bisphenoidal class rather than the orthorhombic bipyramidal, as done by Melville. This is in harmony with the rotary properties of the crystals.

The crystals possess a good cleavage parallel to the macropinacoid,  $a(100)$ .

The plane of the optical axes is parallel to  $a(100)$ .

*Mineralogical Laboratory, University of Michigan."*

\* Drug. Circ., March, 1896, 56-57.



Isocalycanthine Hydrochloride,  $C_{11}H_{14}N_2.HCl.H_2O$ . The salt forms thick needles, darkens at  $204^\circ$ , and melts to black liquid at  $208^\circ$ .\* It is stable in the air, but quickly loses its water of crystallization in vacuo over sulphuric acid.

0.3451 Gm. lost in desiccator 0.0275 Gm., and 0.2878 Gm. lost 0.0228 Gm. Calculated for,  $C_{11}H_{14}N_2.HCl.H_2O$ , 7.88  $H_2O$ . Found 7.97 and 7.92  $H_2O$ .

For an estimation of Cl and the rotation the anhydrous salt was used. 0.1698 Gm. gave 0.1168 Gm. AgCl, and 0.1637 Gm. gave 0.1119 Gm. AgCl. Calculated for,  $C_{11}H_{14}N_2.HCl$ , 16.83 Cl. Found 17.01 and 16.90 Cl.

A solution of 0.6755 Gm. in 25 Cc. water gave in 200 Mm. tube at  $23^\circ$  a rotation of  $22.38^\circ$ . Hence  $[\alpha]_D^{25} = 414.14^\circ$ .

The formula of the hydrochloride was further corroborated by titration with  $\frac{N}{10}$  KOH using phenolphthalein as indicator. 0.2070 Gm. of the hydrated hydrochloride consumed 8.95 Cc.  $\frac{N}{10}$  KOH, and 0.1958 Gm. consumed 8.72 Cc. Calculated for,  $C_{11}H_{14}N_2.HCl.H_2O$ , 9.01 and 8.53 Cc. respectively.

Isocalycanthine Hydrobromide,  $C_{11}H_{14}N_2.HBr.H_2O$ . The salt forms thin needles. When quickly heated it darkens at  $207^\circ$ , and melts to black liquid at  $210-11^\circ$ . When quickly heated to  $190^\circ$ , then slowly to  $202^\circ$  ( $1^\circ$  in 2 minutes), and then kept for 4 or 5 minutes at this temperature, the salt melts to black liquid. It is stable in the air, but readily gives off its water of crystallization in vacuo over sulphuric acid.

2.1724 Gm. lost in desiccator 0.1386 Gm., and 2.4410 Gm. lost 0.1567 Gm. Calculated for,  $C_{11}H_{14}N_2.HBr.H_2O$ , 6.59  $H_2O$ . Found 6.38 and 6.42  $H_2O$ .

For the estimation of Br the hydrated salt was used. 0.2747 Gm. gave 0.1884 Gm. AgBr, and 0.3531 Gm. gave 0.2430 Gm. AgBr. Calculated for,  $C_{11}H_{14}N_2.HBr.H_2O$ , 29.28 Br. Found 29.19 and 29.29 Br.

For determining the rotation the anhydrous salt was used. A solution of 0.3576 Gm. in 25 Cc. water gave in 200 Mm. tube at  $19.5^\circ$  a rotation of  $9.88^\circ$ . Hence  $[\alpha]_D^{19.5} = 345.36^\circ$ .

Isocalycanthine Hydriodide,  $C_{11}H_{14}N_2.HI.1.5H_2O$ . The salt forms thin needles of a very slight yellowish tint, which deepens when the water of crystallization is removed in desiccator. It darkens at  $211^\circ$ , and melts at  $213$  to black liquid.

1.9096 Gm. lost in desiccator over sulphuric acid 0.1542 Gm. Calculated for,  $C_{11}H_{14}N_2.HI.1.5H_2O$ , 8.22  $H_2O$ . Found 8.07  $H_2O$ .

For the estimation of I and determination of the rotation the anhydrous salt was used. 0.2064 Gm. gave 0.1604 Gm. AgI, and 0.2589 Gm. gave 0.2004 Gm. AgI. Calculated for,  $C_{11}H_{14}N_2.HI$ , 41.99 I. Found 41.99 I and 41.82 I.

\* All melting points given in this paper were taken in an Anschuetz and Schulz apparatus of about 250 Cc. capacity.

A solution of 0.3591 Gm. in 50 Cc.  $\text{H}_2\text{O}$  gave at  $24^\circ$  in 200 Mm. tube a rotation of  $4.32^\circ$ . Hence  $[\alpha]_D^{25} = 300.75^\circ$ .

Isocalycanthine Chlorplatinate,  $(\text{C}_{11}\text{H}_{14}\text{N}_2)_2 \cdot \text{H}_2\text{PtCl}_6 \cdot 2\text{H}_2\text{O}$ . The salt contains more water of crystallization, and is considerably lighter in color, than the corresponding salt of calycanthine. The crystal form seems to be the same. It turns brown at about  $213^\circ$ , and then gradually becomes darker and darker upon further heating, but does not seem to melt even at  $310^\circ$ . One of the two molecules of water of crystallization goes away in vacuo over sulphuric acid or when the salt is heated to  $110^\circ$  for about 5 hours; the other goes away only when the monohydrate is heated to  $150^\circ$  for 3 hours. 0.5697 Gm. lost under the first conditions 0.0134 Gm. Calculated for one molecule,  $\text{H}_2\text{O}$  2.27  $\text{H}_2\text{O}$ . Found 2.35  $\text{H}_2\text{O}$ . Under the second conditions 0.5697 Gm. lost 0.0255 Gm. Calculated for two molecules  $\text{H}_2\text{O}$  4.54  $\text{H}_2\text{O}$ . Found 4.48  $\text{H}_2\text{O}$ . With the loss of the water of crystallization the yellow color of the salt changes to brown.

For the estimation of Pt and Cl the hydrated salt was used. 0.3390 Gm. gave 0.0835 Gm. Pt, and 0.4916 Gm. gave 0.1211 Gm. Pt. Calculated for,  $(\text{C}_{11}\text{H}_{14}\text{N}_2)_2 \cdot \text{H}_2\text{PtCl}_6 \cdot 2\text{H}_2\text{O}$ , 24.54 Pt. Found 24.63 and 24.63 Pt.

0.1597 Gm. gave 0.1724 Gm. AgCl and 0.1760 Gm. gave 0.1905 Gm. AgCl. Calculated for,  $(\text{C}_{11}\text{H}_{14}\text{N}_2)_2 \cdot \text{H}_2\text{PtCl}_6 \cdot 2\text{H}_2\text{O}$ , 26.79 Cl. Found 26.69 and 26.76 Cl.

Isocalycanthine Chloraurate,  $3(\text{C}_{11}\text{H}_{14}\text{N}_2 \cdot \text{HAuCl}_4) + 2(\text{C}_{11}\text{H}_{14}\text{N}_2 \cdot \text{HCl} + 2\text{H}_2\text{O})$ . The salt contains half a molecule of water of crystallization less than the corresponding calycanthine salt, otherwise it has the same rather unusual composition, and, like the calycanthine salt, is decomposed with liberation of the hydrochloride, when it is dissolved in alcohol and the solution covered with ether. The crystal form seems to resemble the corresponding calycanthine salt. It darkens and shrinks to a pasty mass at  $186.5^\circ$ , and then does not change even up to  $260^\circ$ .

0.2178 Gm. lost in desiccator over phosphorus pentoxide 0.0043 Gm., and 0.3833 Gm. lost 0.0073 Gm. Calculated for above formula 1.8  $\text{H}_2\text{O}$ . Found 1.97 and 1.9  $\text{H}_2\text{O}$ .

For the estimation of Au and Cl the hydrated salt was used. 0.2171 Gm. gave 0.0630 Gm. Au, and 0.2121 Gm. gave 0.0618 Gm. Au. Calculated for above formula 29.59 Au. Found 29.02 and 29.14 Au.

0.1984 Gm. gave 0.1982 Gm. AgCl, and 0.1934 Gm. gave 0.1896 Gm. AgCl. Calculated for above formula 24.82 Cl. Found 24.24 and 24.70 Cl.

Isocalycanthine Nitrate,  $\text{C}_{11}\text{H}_{14}\text{N}_2 \cdot \text{HNO}_3$ . Dissolve 5 Gm. air-dried isocalycanthine in 40 Cc. water containing a slight excess of acetic acid, and add about 6 Gm. potassium nitrate dissolved in 30 Cc. water. At first there is no change, but on standing over night most of the nitrate crystallizes out in thick prisms.\*

\* The exact crystallographic dimensions of all the salts of isocalycanthine will be given later.

The salt seems to be a little less soluble in water than calycanthine nitrate. Heated in open capillary, it turns yellow on the surface at  $183.5^{\circ}$ , the color then gradually spreads downwards till at  $189^{\circ}$  the whole is turned to a dark pasty mass. In a vacuum capillary the whole turns yellow at  $184.5^{\circ}$ , and melts at  $192-94^{\circ}$  to a reddish liquid.

A solution of 0.3043 Gm. in 100 Cc. water gave in 200 Mm. tube at  $20^{\circ}$  a rotation of  $2.27^{\circ}$ . Hence  $[\alpha]_D^{20} = 372.99^{\circ}$ .

0.2024 Gm. gave 0.4108 Gm.  $\text{CO}_2$  and 0.1153 Gm.  $\text{H}_2\text{O}$  and 0.1589 Gm. gave 25.5 Cc. N at  $23^{\circ}$  and 750 Mm. Calculated for,  $\text{C}_{11}\text{H}_{14}\text{N}_2\cdot\text{HNO}_3$ , 55.66 C, 6.38 H and 17.72 N. Found 55.35 C, 6.37 H and 17.75 N.

Isocalycanthine Acid Sulphate,  $\text{C}_{11}\text{H}_{14}\text{N}_2\cdot\text{H}_2\text{SO}_4\cdot 1.5\text{H}_2\text{O}$ . The salt was made by the same method as the corresponding calycanthine salt. It melts unsharply at  $186.7^{\circ}$ . The water of crystallization is easily removed in vacuo over sulphuric acid. The anhydrous salt becomes dark and pasty at  $185.6^{\circ}$ .

0.4283 Gm. lost in desiccator over sulphuric acid 0.0393 Gm., and 0.3359 Gm. lost 0.03 Gm. Calculated for above formula 9.03  $\text{H}_2\text{O}$ . Found 9.17 and 8.93  $\text{H}_2\text{O}$ .

The samples used for the estimation of water of crystallization were also used for estimation of S. The first gave 0.3354 Gm.  $\text{BaSO}_4$  and the second 0.2634 Gm.  $\text{BaSO}_4$ . Calculated for  $\text{C}_{11}\text{H}_{14}\text{N}_2\cdot\text{H}_2\text{SO}_4\cdot 1.5\text{H}_2\text{O}$  10.71 S. Found 10.75 and 10.77 S.

A solution of 0.4239 Gm. of the hydrated salt in 25 Cc. water gave at  $27^{\circ}$  in 200 Mm. tube a rotation of  $9.89^{\circ}$ . Hence  $[\alpha]_D^{27} = 289.28^{\circ}$ .

Several other salts of isocalycanthine were made. Their analytical data will be given later.

The investigation is to be continued.

*Northwestern University School of Pharmacy, Chicago, Ills.*

#### OIL OF SANDALWOOD.

BY A. R. L. DOHME AND H. ENGELHARDT.

Our publications\* on this subject have been criticised by Mr. E. J. Parry and Messrs. Schimmel & Co. In both papers we pointed out, on the strength of numerous assays of sandal oils distilled by ourselves, that it is difficult always to obtain an oil with an optical rotation as required by the U. S. P. We have shown that many oils which in every other respect came up fully to the official tests, as far as specific gravity, solubility in 70 per cent. alcohol, etc., is concerned, did not have the high rotatory power,  $-16^{\circ}$  to  $-20^{\circ}$ , demanded by the U. S. P. We have examined a number of other oils of our own distillation, as well as some bought in the open market, and we can state again that the oils do not always answer the official requirements for optical rotation. We stated in our last paper that

\* Proc. A. Ph. A., 1906, Amer. Drug., 49, page 145; Am. Journ. Pharm., 1908, page 51.

the main criterion for the purity of sandal oil is the percentage of santalol, the active principle, and further, that when an oil, in addition to the presence of the proper amount of this constituent, is soluble in 5 parts or more of 70 per cent. alcohol at 30° C., and possesses the correct specific gravity, it can safely be pronounced as genuine and unadulterated, notwithstanding its somewhat lower rotatory power. The latter test and the estimation of the acid and saponification numbers we have considered as of secondary value.

Gildemeister and Hoffmann\* state: "The best means for ascertaining the purity of sandalwood oil, or the amount of an adulterant, is to determine the santalol content. Good oils mostly contain from 93 to 98 per cent., never less than 90 per cent., of santalol."

Further, we stated that those substances which are used frequently for adulterating sandal oil have some influence on the one or the other of the three requirements, and by the oil not answering these tests an adulteration could easily be detected. An oil adulterated with castor oil, cedarwood oil, West Indian sandal oil, etc., would never be soluble in 5 parts or more of 70 per cent. alcohol, and if these adulterations were present to any appreciable amount they would also reduce the percentage of santalol.

Our suggestions to reduce the requirements for the optical rotation and to carry out the solubility test at 30° C. instead of at the official temperature of 25° C. have been criticised by Mr. E. J. Parry† and Messrs. Schimmel & Co.‡ Parry states that the abnormalities of the sandal oil are due to the using of the different fractions of the distillation separately, without mixing them together. This, in our opinion, is not absolutely correct. The first fraction usually is distinctly abnormal, showing a lower specific gravity, and being in most cases insoluble in 5 parts of 70 per cent. alcohol. This fraction is even considered as producing injurious by-effects, and is usually rejected by most manufacturers. The last portions of the distillation usually have a higher specific gravity, due to resinification, which takes place by the prolonged heating necessary to drive over all the oil. Mr. Parry advocates retaining the optical rotation, —16° to —20°, as "a reduction of this requirement would encourage the use of a little more of a favorite adulterant now used." We do not know to what adulterant he refers, but can it not be detected by its solubility in 70 per cent. alcohol or by the lowering or increasing the specific gravity or by the reduction of the percentage of santalol?

Further, Mr. Parry states that the U. S. P. solubility test, 1 in 5 at 30° C., is a fair one. The test of the U. S. P. reads: "Soluble in 5 volumes of 70 per cent. alcohol," without a specified temperature. As the normal temperature adopted by the U. S. P. is 25° C., and as several oils are

\* The Volatile Oils, page 342.

† Chemist and Druggist, LXXII, page 489.

‡ Semi-Annual Report, April, 1908.

examined did not meet the solubility at 25° C., we recommended to allow a raise of temperature to 30° C. However, in numerous distillations of oil, which were made since the publication of our last paper, we obtained products which were easily soluble in 5 parts of 70 per cent. alcohol at 25° C., and we shall be perfectly satisfied if this requirement is not changed.

Mr. Parry's statement that the abnormal oils, on which we reported in our paper, were distilled probably from partly rotten wood is not correct. The wood used for the distillation was in a perfectly normal and healthy condition.

While Messrs. Stafford, Allen & Sons\* agree with Mr. Parry's article, Messrs. W. I. Bush & Co.† are in general of our opinion, and reiterate in regard to the optical rotation what we have reported in our last paper.

Messrs. Evans Sons, Lescher & Webb‡ report on 109 oils, of which 20 per cent. had a lower optical rotation than -16°. They say: "Modern adulterants are difficult to detect by either the rotation or the solubility test, and these are gradually held in less repute than purely chemical methods." They advocate retaining the solubility test.

Messrs. Schimmel & Co.§ consider our view, that the estimation of the santalol content is sufficient, as erroneous, "as on acetylation the santalol is not determined as such, but as an alcohol, and every other alcohol would here give the same values as santalol." It is not clear to us to what kind of alcohol they refer. Besides the santalols ( $\alpha$  and  $\beta$ ), insignificant quantities of other substances of an alcoholic character are found in sandal oil, and these in all probability would not influence the estimation of santalol to any extent.

Would these "every other alcohol," not deriving from sandalwood, have no influence on the solubility in 70 per cent. alcohol? They may reduce or increase the optical rotation, and may have an influence on the acid and saponification numbers. But would these alcohols not influence the specific gravity and would they have a similar molecular weight to that of santalol? Would not a higher or lower molecular weight influence the calculation for santalol considerably?

If such adulterations with alcohols can easily be made and cannot be detected by other tests than merely the optical rotation, the estimation of santalol might be omitted altogether.

In conclusion we wish to state again that we put very little reliance on the optical rotation, and that we consider as genuine a sandal oil which contains at least 90 per cent. of santalol, is soluble in 5 parts of 70 per cent. alcohol at 25° C. or 30° C., and has a specific gravity of 0.965 to 0.980 at 25° C.

Whenever an oil does not meet these requirements it may be considered

---

\* Chemist and Druggist, LXII, page 541.

† *Ibid.*

‡ *Ibid.*, page 542.

§ *Loc. cit.*

as suspicious, and the estimation of the acid and saponification numbers may help considerably to detect the nature of the adulterant.

*Baltimore, July 18, 1908.*

# PURITY OF SOME OFFICIAL AND NON-OFFICIAL DRUGS AND CHEMICALS.

BY A. R. L. DOHME AND H. ENGELHARDT.

The chemicals and drugs examined in the laboratory during the period from June 1, 1907, to June 1, 1908, total number, 10,072, showed in general a much higher purity than in former years, due without any doubt to the Pure Food and Drugs Act. A small percentage only did not meet the requirements of the U. S. P. and the leading text-books, and consequently had to be rejected. The following products did not come up to the required standard.

*Acacia.* One sample contained an excess of mineral matter, viz., 8 per cent.

*Aspirin.* One sample was rejected on account of a strong odor of acetic acid.

*Asafetida.* It is very difficult to obtain a good product. Many shipments and samples had to be rejected, containing insufficient alcohol-soluble matter or yielding too much ash on incineration, or being faulty in both respects. The following figures speak for themselves:

Per cent. Alcohol-soluble Matter.	Per cent. Ash.
53.0	23.5
43.7	31.5
57.7	21.7
47.8	34.0
63.8	20.5
47.8	31.0
25.3	47.2
50.5	21.4
39.9	44.8
45.4	24.5

etc., the requirements of the U. S. P. being that not less than 50 per cent. should be soluble in alcohol; ash not more than 15 per cent.

*Arsenous Acid.* Three shipments were rejected, assaying below the U. S. P. standard.

*Aconite Root.* We did not experience any difficulty in procuring a good drug; shipments with 0.7 per cent.—0.9 per cent. alkaloids could easily be obtained.

*Belladonna Root.* Although we did not experience any trouble in securing our supply of this drug with a higher alkaloidal strength than required by the U. S. P., we have examined samples which fell considerably below the standard, assaying as low as 0.17 per cent. of total mydriatic alkaloids. Some figures may illustrate this deficiency. 0.17 per cent.,

0.28 per cent., 0.20 per cent., 0.40 per cent., 0.41 per cent., 0.45 per cent., etc.

*Belladonna Leaves.* This drug was also obtainable in sufficiently good quality, although some samples were submitted to us with mydriatic alkaloids as low as 0.22 per cent., 0.25 per cent., 0.30 per cent., 0.27 per cent., 0.25 per cent., etc., necessitating rejection.

*Barley Malt.* Considerable trouble was experienced with barley malt, as many of the samples examined contained too much acid, and did not have the proper amount of diastase, which would make them unfit for use in making malt extracts. For determining the quality of malt and its preparations, we used the method adopted by Harrison and Gair, published in the Year Book of Pharmacy, 1906, which we found to answer very well.

*Bismuth Subcarbonate.* One shipment was rejected on account of its dark color.

*Natural Benzoic Acid.* In two samples a considerable amount of chlorides was found to be present, and the chemical, therefore, was apparently adulterated with synthetic benzoic acid.

*Siam Bensoin.* A sample of this drug was rejected, yielding 90 per cent. of alcohol-soluble matter only, the U. S. P. requirement being 95 per cent.

*Copaiba.* The shipments of this balsam were all satisfactory with one exception, which speaks well for the Pure Food and Drug Law. The rejected sample contained more than the allowed amount of gurjun balsam. We have tried the method for detecting this adulteration communicated by Turner in Pharm. Centralhalle, 1907, page 425, and we find that it gives very good results. For detection of rosin we have applied with much success the method published by Walbum in the Pharm. Centralhalle, 1907, page 437, and we have found the method to be superior to that originated by Bosetti.

*Peru Balsam.* The shipments have been of good quality also. Attention may be called to *perugen*, so-called synthetic Peru balsam. This name, however, is a misnomer, and should read "artificial," as it is a mixture of the various constituents of Peru balsam with styrax. To distinguish the artificial product from the natural, the method published by Dieterich in the Berichte der deutschen Pharm. Gesellschaft, 1908, No. 3, may be applied with good results.

*Styrax.* One shipment had to be rejected on account of too large an amount of water being present.

*Chloroform.* We have examined several makes of chloroform "pro narcosi," and have found that not one answered perfectly the requirements as laid down in the Ph. Ned. We wish to emphasize again that the new U. S. P. should adopt a chloroform for anesthetic use, with stringent requirements similar to those published in other pharmacopœias of recent date.

*Calcium Chloride.* We received and rejected a lot of calcium chloride, U. S. P., which contained about 28 per cent. of magnesium chloride.

*Carbolic Acid.* Three samples assayed less than 96 per cent. of absolute phenol.

*Caramel.* The shipments of this preparation varied in colorimetric value from 50 to 65.

*Collodion.* One lot, which answered all the requirements of the U. S. P. as to the percentage of pyroxylin, etc., became very cloudy when mixed with balsam of fir and castor oil, and after standing for 24 hours, a heavy sediment was produced in the mixture.

*Camphor.* All the samples examined were specimens of natural camphor with the exception, possibly, of one, which had to be rejected on account of its odor and too low a melting point. As synthetic camphor has a lower M. P. than natural, and when produced by certain processes cannot be freed entirely from by-products, cymene, etc., this sample may be considered as a synthetic product, although Borisch's reaction with vanillin-hydrochloric acid did not give positive results. One lot of camphor had a dark color and disagreeable odor, and was rejected.

*Cocoa.* A sample of powdered cocoa had to be rejected, containing about 25 per cent. of powdered shells.

*Chlorinated Lime.* Some difficulty was experienced in purchasing this article. Several shipments assayed much below the required 30 per cent. of available chlorine.

*Colchicum Seed.* The percentage of colchicine varied from 0.4 per cent. to 0.6 per cent. The results obtained by the assay method of the U. S. P. are too high, and the method should be revised. By using Panchaud's method a colchicine free from any admixtures can be obtained.

*Calcium Sulphide* (Sulphuretted lime). Several shipments were rejected, not yielding sufficient sulphuretted hydrogen.

*Cinchona Barks.* About 30 per cent. of the samples examined assayed below the U. S. P. standard. It has been pointed out in our last paper that the assay process of the U. S. P. gives somewhat too low results even with the modifications adopted later, and might advantageously be replaced by Fromme's method. This method gives higher and, without doubt, more accurate results.

*Ergot.* This drug last year again was of a rather poor quality. A drug with 0.2 per cent. of cornutine, not infrequent in former years, could hardly be obtained. Although the determination of the percentage of cornutine is of a relative value only, it can serve, probably as well as any other method known to-day, for the valuation of the drug.

*Gold and Sodium Chloride.* Two shipments assayed 24 per cent. of metallic gold only. The samples were marked, however, "for photographic purposes," and were sent by mistake.

*Henbane.* The shipments were not at all of the good quality as obtained



in former years. Leaves with 0.14 per cent. of mydriatic alkaloids which at one time could be obtained easily, were rather rare.

*Ipecac.* A sample was submitted, assaying 0.938 per cent. of total alkaloids only.

*Jalap.* This year again it was difficult to obtain this drug with the required amount of resin, viz., 7 per cent. A large number of samples assayed below this standard. Immature root is largely the cause of this. England gets the choicest jalap, and it is only by rejecting the inferior quality that we will teach the Mexicans to send us what we want.

*Kaolin.* A shipment was strongly adulterated with calcium carbonate.

*Powd. Ext. Licorice.* In a shipment offered to us 30 per cent. of water insoluble matter (starch) was found.

*Lupulin.* A shipment contained only 56 per cent. of ether-soluble matter, while the U. S. P. requires 60 per cent. The ash obtained by incinerating the drug with ammonium nitrate amounted to 23.4 per cent. (U. S. P. not more than 10 per cent.).

*Milk Sugar.* The test of the revised U. S. P. to detect cane sugar in milk sugar works very well. A new test for cane sugar communicated by Anselmino in the Pharm. Centralhalle, 1908, page 99, depending on the fermentative action of yeast on cane sugar was repeatedly tried in this laboratory, but no satisfactory results could be obtained.

*Methylene Blue.* The requirements for ash, viz., 0.4 per cent. are rather stringent. We repeatedly received samples of this preparation which yielded ash up to 1.2 per cent. The ash, however, was perfectly free from zinc.

*Magnesium Oxide.* The test of the U. S. P. for carbonate is rather indistinct. A quantitative determination would be advisable.

*Nitrous Ether Concentrated.* A shipment had to be rejected, assaying 75 per cent. of absolute nitrous ether only instead of 90 per cent. as claimed.

*Potassium Permanganate.* A shipment contained a considerable quantity of sulphate.

*Quinine and Urea Hydrochloride.* Products with the exact melting-point generally given as 70–71° C., could very seldom be obtained; most of the samples melted at a somewhat higher temperature.

As *Papain* is used very much at the present time, an accurate assay method for this ferment would be desirable. The digestive test with blood-fibrin does not give satisfactory results.

*Resin Scammony.* We have examined a great many samples, but we have found that a true resin, the virgin resin of the U. S. P., can hardly be obtained. Most of the samples submitted were either resins extracted by alcohol from the true root, or extracted with a suitable solvent from the Mexican root, *Orizaba Mexicana*, or were a mixture of both. The solubilities in ether and chloroform of the last three mentioned products vary

widely from those obtained in virgin scammony derived from the exudate scammony. It is an established fact, however, that these two non-official resins are therapeutically as active as the virgin resin, and it would be very desirable, if the committee of revision of the next U. S. P. would investigate this matter, and if found acceptable, as we have found it to be, that the extracted resins also be made official. There is at present very little virgin scammony resin obtainable.

*Scopola Root.* Sixty per cent. of the samples were deficient in alkaloids. We have noticed that a drug with 0.7 per cent. to 0.8 per cent. of alkaloids, which in former years could easily be obtained, was impossible to get. We would again point out that this drug should be made officially interchangeable with belladonna. We suggested in a paper read last year, "*Scopola versus Belladonna*," and we find several German authorities have agreed with us. We would like to suggest that to settle this matter a committee consisting of Messrs. S. W. Williams, H. H. Rusby, F. B. Kilmer, Reid Hunt and A. R. L. Dohme be appointed to study the question fully and report to this Section next year.

*Stearic Acid.* The melting-point as given in the U. S. P., viz., 56° C. for commercial acid seems to be rather high; most of the samples examined melted at 54–55° C.

*Saffron* has been omitted from the present U. S. P. This is unfortunate, in our opinion, as this drug is still used considerably and is frequently adulterated.

*Salicylic Acid.* We have examined salicylic acid and its derivatives according to Carletti for phenol and phenol-like bodies. The results of these investigations will be reported in detail in another paper to be presented to this society.

*Sodium Hypophosphite* showed too strong an alkalinity, containing over 2 per cent. of sodium carbonate.

It has always been difficult to estimate the volatile alkaloids volumetrically. In case of *Sparteine Sulphate* we have recently applied the Prescott-Gordin iodometric method, and we have obtained very good results by it. This method we invariably apply for the estimation of sparteine in tablets, etc.

*Scopolamine Hydrobromide.* The optically active form seems to be marketed exclusively. In former years we often received the inactive variety, but during the last year only one shipment showed a deficiency in the rotatory power.

*Sterilization.* The U. S. P. should go into this thoroughly. It is now almost the only pharmacopœia that ignores this most important question.

*Vanillin* very often showed a lower melting-point than given by the U. S. P.

A shipment of *Yellow Mercurous Iodide* had to be rejected, as it contained too much red mercuric iodide.

*Zinc Phosphide.* One lot showed a presence of Al, Fe, Pb, and As.

In our report last year we pointed out that the volatile oils frequently did not come up to the requirements of the U. S. P. During the last year these chemicals have been received of a much greater purity, and only a few did not answer the official tests.

Very much trouble was experienced with *Ethereal Oil*, either the sp. g. or the color often being wrong.

*Oil of Wintergreen Natural* also showed too deep a color occasionally.

For some oils the requirements of the U. S. P. should be more stringent especially for *Oil of Cade* and *Oil of Juniper*. Preparations, grossly adulterated, can easily escape the lenient tests of the U. S. P.

The optical rotation of *Sandal Oil* is entirely too high. We do not wish to refer to this oil here, as this subject will be dealt with in another article.

Some very bad oils were offered for sale, and may be mentioned here.

*Croton Oil* with a sp. gr. 0.899 instead of 0.935—0.950, and a saponification value of 119 instead of 205.

*Oil Eucalyptus* polarizing  $-21^\circ$  instead of "not more than  $+10^\circ$ ."

*Oil of Bitter Orange.*  $a_D = +60^\circ$  instead of not less than  $+90^\circ$ .

*Savin Oil.*  $a_D = -22^\circ$  instead of  $+40^\circ$  to  $+60^\circ$ .

*Baltimore, August, 1908.*

The Chair here made a number of announcements: One as to the taking of a photograph of the members of this Association in front of the hotel; another, as to the desirability of signing the register; still another, as to making special-car reservations on the Iron Mountain for Saturday. He also called attention to a change in time of the meeting of the Section on Historical Pharmacy to 10 o'clock to-morrow morning instead of to-morrow night.

Mr. Hynson announced a meeting of the Committee on Reorganization, and invited a full attendance of the members at the session to be held at 3 o'clock this afternoon.

The Chair called on Mr. Henry Kraemer to read his paper on the difference in structure of belladonna and scopola, illustrated by drawings put upon the desk.

Mr. Kraemer presented his paper in abstract, explaining the charts set up before the members. The text of his paper here follows:

#### SOME OF THE DISTINGUISHING MORPHOLOGICAL CHARACTERS OF BELLADONNA AND SCOPOLIA.

BY HENRY KRAEMER.

*Atropa Belladonna* and *Scopolia carniolica* are both members of the *Solanaceæ*, and stand in close relationship. The former belongs to the *Solanæ-Lyciinae*, or group of plants characterized by tubular corollas and

berry-like fruits, and the latter to the *Solaneæ-Hyoscyaminaæ*, or plants with funnel-shaped corollas and transversely dehiscent capsular fruits. To this latter sub-group also belongs the genus *Hyoscyamus*, and botanically *Scopolia* appears to be more closely allied to *Hyoscyamus* than to *Belladonna*.

According to v. Wettstein,<sup>1</sup> *Atropa Belladonna* is found throughout Europe, extending to the Caucasus Mountains and Persia. The plant is also cultivated in Europe, and in some localities in the United States. The leaves and flowering tops are official in probably all of the pharmacopœias, while the roots are official in only some of these standard authorities.<sup>1</sup> Both the roots and herb have been carefully investigated microscopically<sup>2</sup> and chemically, but the subject cannot be considered to be exhausted, particularly in view of the necessity of differentiating them from other drugs which are mixed with or substituted for them.

While *Scopolia carniolica* was described by the earlier botanists, and while it has been used medicinally for many years, it is only recently that the drug has come into prominence, the rhizome and roots now being official in the U. S. Pharmacopœia. The habitat of the plant, according to v. Wettstein,<sup>1</sup> includes the region of the Eastern Alps, the Carpathian Mountains, and the adjoining country, the plant therefore being much more limited in its range than that of *Atropa Belladonna*. The natural history of the drugs derived from *Scopolia carniolica* has been given by Holmes,<sup>3</sup> Maisch,<sup>4</sup> and Nevinny.<sup>5</sup> Greenish<sup>6</sup> has compared the histological characters of the rhizome of *Scopolia carniolica* with those of the root of *Atropa Belladonna*, and Moeller<sup>7</sup> has made a comparative study of the leaves of these two plants.

Having occasion the past summer to examine belladonna roots and herb, and scopolia rhizome, roots and herb, and owing to the need of more definite comparative information for identifying and differentiating these drugs in both the crude and powdered condition by reason of their frequent admixture, it seems to me to be desirable to present my results at this time.

*Belladonna Root.* The following tissues and elements are found in belladonna root: Parenchyma containing starch and cryptocrystalline crystals of calcium oxalate, which is by far the most abundant tissue present; tra-

#### LITERATURE CITED.

- <sup>1</sup> R. v. Wettstein: Engler and Prantl's Pflanzenfamilien.
- <sup>2</sup> Tschirch and Oesterle's Anatomischer Atlas; Vogl's Pharmakognosie; Moeller's Pharmacognostischer Atlas; Kraemer's Botany and Pharmacognosy (3rd edition).
- <sup>3</sup> E. M. Holmes: *Pharmaceutical Journal and Transactions*, 20, (1889), p. 468.
- <sup>4</sup> John M. Maisch: *American Journal of Pharmacy*, 62, (1890), p. 107.
- <sup>5</sup> Joseph Nevinny: *Pharmaceutische Post*, 27, (1894), p. 333.
- <sup>6</sup> Thomas Greenish: *Pharmaceutical Journal and Transactions*, 20, (1889), p. 471.
- <sup>7</sup> Citation by Maisch from Moeller's Pharmakognosie, loc. cit.

cheæ or ducts; wood fibers; cork, and occasionally bast fibers. The starch grains are single or 2- to 3- compound, from 5 to 25  $\mu$  in diameter and vary from spherical to ellipsoidal, ovoid, frequently with a cleft at the point of origin of growth. The crystals of calcium oxalate are deltid or arrow-shaped, and vary from 4 to 15  $\mu$  in diameter. They are packed in the cells in which they occur, and are readily distinguished in the powdered drug by means of the micro-polariscope. The tracheæ are strongly lignified, and are of two kinds,—those with simple pores and those with bordered pores. The tracheæ with the simple pores are the ones that have been most frequently described. The pores are slit-like and are from 10 to 17  $\mu$  long, being usually transverse. The tracheæ with bordered pores, Fig. 77, B, have not been heretofore described. They vary from 50 to 90  $\mu$  in width. In radial-longitudinal section the bordered pores are elliptical or circular in outline, and vary from 5 to 8.5  $\mu$  in diameter. The pore itself is narrow, bi-convex and transverse to the long diameter of the border. With phloroglucin and hydrochloric acid, and chloral solution the wall swells to such an extent as to obscure the border. The wood fibers are lignified and have simple oblique pores, but pass into tracheids having bordered pores. The cork cells are similar to those usually found in plants, the younger ones being sometimes somewhat lignified.

*Scopolia Rhizome and Roots.* Practically the same tissues are present in scopolia rhizome and roots as are found in belladonna root except wood

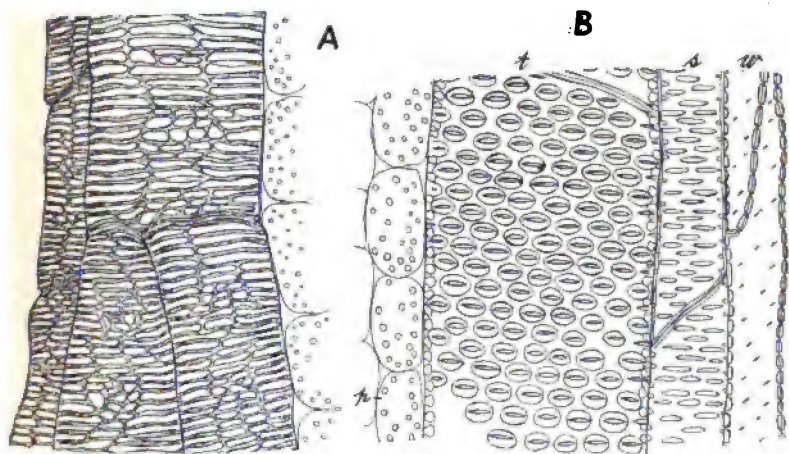


FIG. 77—A, longitudinal section of portion of rhizome of *Scopolia carnolica* showing reticulate tracheæ: B, longitudinal section of portion of the root of *Atropa Belladonna* showing wood fibers (w) with simple, oblique pores, tracheæ (s) with simple pores, tracheæ (t) with bordered pores and parenchyma cells (p) containing starch.

and bast fibers. The starch grains are mostly spherical and on an average smaller than those in belladonna root, being from 3 to 13  $\mu$  in diameter.

Cryptocrystalline crystals of calcium oxalate are present and resemble those found in belladonna root, but are more elongated or pyramid-like, and occasionally form aggregates, which latter are about  $15\ \mu$  in diameter. The tracheæ (Fig. 77, A) vary from  $25$  to  $100\ \mu$  in diameter, and are

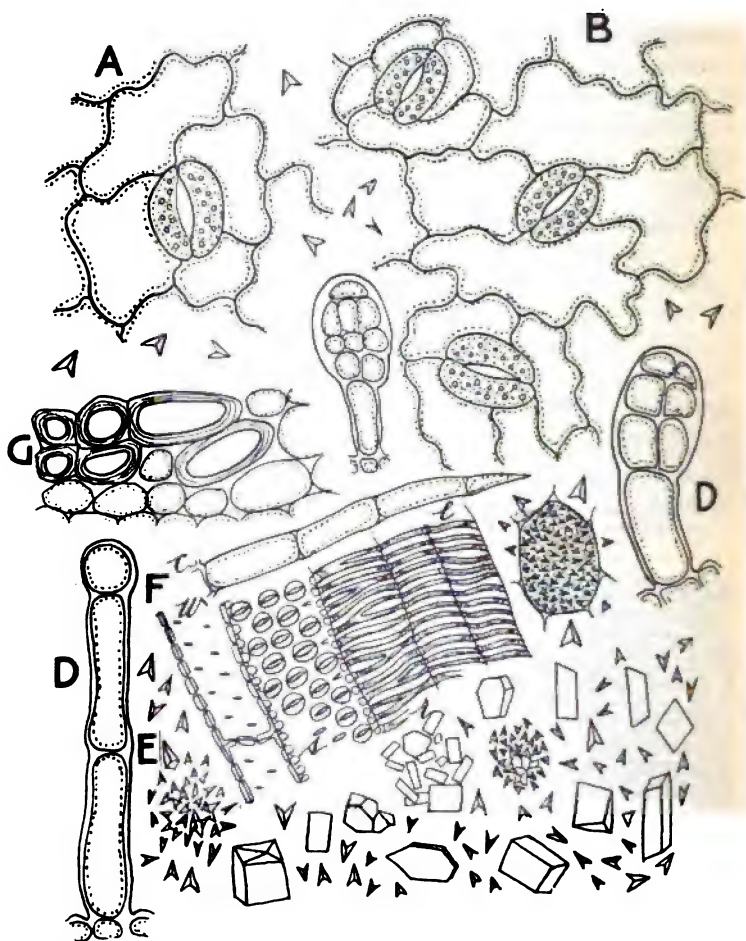


FIG. 78.—Belladonna Herb: A, surface section of upper epidermis showing one stoma; B, surface section of under epidermis showing three stomata; C, 4-celled non-glandular hair; D, glandular hairs; E, crypto-crystalline crystals of calcium oxalate; F, longitudinal section of portion of stem showing wood fibers (w), tracheæ (s) with bordered pores, tracheæ (x) with reticulate markings, tracheæ (l) with annular and spiral markings; G, transverse section of portion of stem showing six bast fibers and a few parenchyma cells.

especially characterized by having reticulate markings. Tracheæ having simple, slit-like pores from  $10$  to  $40\ \mu$  long, are also present. Both kinds of tracheæ are lignified.

*Belladonna Herb.* This drug has three principal distinguishing characteristics: (a) The calyx lobes are rather long and spreading, exposing the berry; (b) the hairs on the leaves, while not numerous, are of rela-

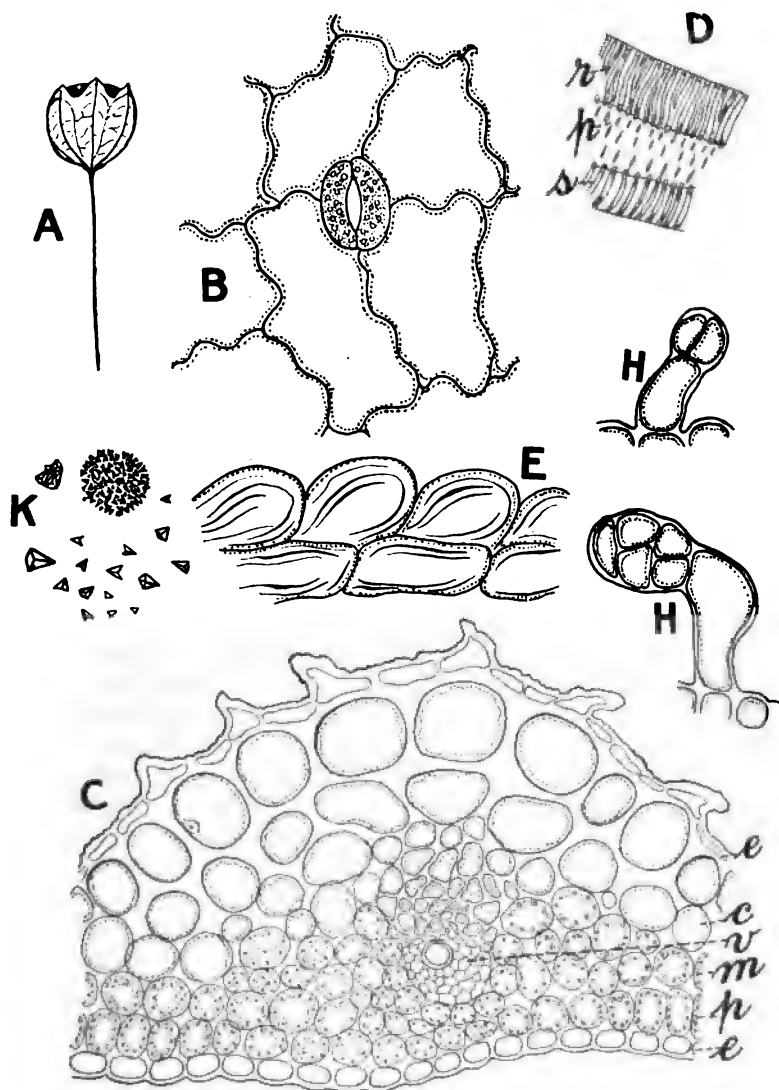


FIG. 79.—*Scopolia* Herb: A, pyxis, about natural size; B, surface section of lower epidermis of leaf; C, transverse section of leaf through a vein showing irregular epidermal cells of the lower surface (e) collenchymatous cells (c), fibrovascular bundle (v), loose parenchyma (m), palisade cells (p) and upper epidermis (e); D, portion of fibrovascular bundle of stem showing tracheae with reticulate markings (r), tracheae with simple pores (p) and tracheae with annular markings (s); E, epidermal cells of lower surface of leaf have foldings due to the irregularity of the outer walls; H, glandular hairs which are occasionally found; K, crypto-crystalline crystals of calcium oxalate.

tively frequent occurrence (Fig. 78, C D); (c) some of the tracheæ have bordered pores (Fig. 78, F). In addition to the small cryptocrystalline crystals of calcium oxalate abundant in some of the cells, there are present in some of the cells of the petiole and stem polygonal crystals (Fig. 78) which are anisotropic and vary from 6 to 15  $\mu$  in diameter, and in still other cells narrow prisms which are in spherite aggregates resembling those of some of the carbohydrates. Besides the tracheæ with bordered pores there also occur in the stem tracheæ with annular, spiral and reticulate markings, and wood fibers and bast fibers. The elements of the fibrovascular bundle are all more or less lignified. The bast fibers are nearly a millimeter long; the ends are pointed; the walls on one side usually are undulate and about 6  $\mu$  thick.

*Scopolia Herb.* The calyx lobes are relatively short, and the capsular fruit (pyxis) is almost completely enclosed by the calyx tube (Fig. 79, A). A very few glandular hairs with a one- or two-celled stalk and two- to six-celled head may with difficulty be found. In addition to tracheæ with annular and spiral markings, and simple pores, there are in the stem tracheæ with reticulate markings, but those with bordered pores do not occur. The crystals of calcium oxalate are of the cryptocrystalline character of those found in belladonna. In glycerin preparations spherite aggregates resembling those of carbohydrates are present, especially in the calyx. Acicular crystals sometimes separate in chloral preparations, but as they are isotropic they are not those of calcium oxalate. The epidermis of the leaves, particularly that of the under surface, is very irregular, giving a tuberculate appearance on transverse section (Fig. 79, C), and in surface view frequently having the appearance of folds (Fig. 79, E). As in the rhizome, bast fibers and wood fibers are apparently not present. There is, however, a strongly developed layer of collenchymatous cells in the stem, the thickening being more uniform and more marked than those in the collenchymatous cells of belladonna.

The Chair invited discussion on the paper just read, but none was offered.

The paper was referred, to take the usual course.

The Chair stated that the next paper was on "The Estimation of Phenol," by Messrs. W. A. Puckner and A. H. Clark. Mr. Clark presented the paper, as follows:

#### THE ESTIMATION OF PHENOL.

BY W. A. PUCKNER AND A. H. CLARK.

The experiments here described were undertaken with a view of evolving a satisfactory method for the isolation and estimation of phenol in pharmaceutical products, such as tablets, powders, etc., when other substances which interfere with a direct estimation are present.

Most of the experiments were made on tablets containing bismuth, opium, aromatic powder, and phenol or on mixtures containing these sub-



stances in known proportions. As a means of isolating phenol, distillation first suggested itself. Some of the substance was placed in a distilling flask, water added, the liquid rendered acid, and then distilled nearly to dryness. The phenol in the distillate was determined by the bromine absorption method of the U. S. P. Results in this way were not quite satisfactory, as it was thought impossible to distill all the phenol and keep the volume of the distillate within such limits as would permit an accurate estimation of the phenol present therein.

Extracting the powdered substance with ether, removing the phenol from the ether solution by shaking with a solution of potassium hydroxide and determining the phenol in this liquid gave results which were uniformly high when applied to mixtures of known composition. This was found to be due to the use of ether, and the method accordingly abandoned.

Extracting the powdered substance with water either by percolation or by maceration, and after standing some time removing an aliquot portion of the clear supernatant fluid, and in this aqueous solution determining phenol, was tried. The results again were high; this and also the difficulty in filtration, uncertainty in measurements, etc., lead to the abandonment of this method.

Extraction after the manner outlined above for ether, substituting chloroform for the ether, gave results which were very uniform, and on mixtures of known compositions were entirely satisfactory. Thus in a prepared mixture containing 7.14 per cent. of crystallized phenol, assaying 96 per cent. by the U. S. P. method, 7.00 per cent., 7.01 per cent., 6.9 per cent., 7.09 per cent. and 7.15 per cent. of the phenol was found.

In trying to confirm the results obtained by extraction with chloroform an entirely different method was suggested, namely, that of distillation in a current of steam. Results obtained by this method at first seemed to agree with and to confirm the accuracy of the chloroform extraction method, but it was soon found that on some of the tablets results considerably higher were obtained, while on the other hand two specimens gave results much lower. In some of these experiments the distillate assumed a yellow color, the tribromophenol did not separate well, and in the final titration the end point was not sharp.

A search for the cause of these untoward results was made. The various substances composing the tablets, including the ingredients of aromatic powder taken separately, were submitted to distillation, using 1 Gm. of each with about 1 Cc. U. S. P. phosphoric acid. The bromine absorption of the distillate was determined, and also its acidity. The results are tabulated below:

Substance.	Cc. $\frac{1}{10}$ Bromine V. S. consumed by 50 Cc. distillate.	Cc. $\frac{1}{10}$ KOH required for 50 Cc. distillate.
Cardamom.....	1.14	1.2
Ginger.....	.12	.2
Nutmeg.....	2.14	.5
Cinnamon.....	2.65	1.
Opium.....	.22	1.3
Bismuth subnitrate.....	not determined.	2.0

When the attempt was made to determine the bromine absorption of the distillate from bismuth subnitrate, the solution of the difficulty presented itself. This distillate was quite acid, and the acidity was readily shown to be due to the presence of nitric acid. Numerous experiments were carried out, using mixtures corresponding to the formula of the tablets under examination, and in every case nitric acid was found in the distillate. The same trouble with the end point in the titration and the same peculiarity of the tribromphenol were noticed here as was mentioned above. From a mixture of known composition about 2-3 of the phenol was recovered. It is apparent from this that in the estimation of phenol in the tablets under examination a number of errors may be introduced. First, since the aromatic powder gives a distillate which absorbs bromine, the results may be too high. Second, the nitric acid in the distillate may liberate bromine from the excess of potassium bromide in the bromine solution and give results which are too low. Third, it may liberate iodine from the potassium iodide, which is added preparatory to the final titration, and in this way also cause low results. Fourth, the nitric acid liberated in the distilling flask may nitrate the phenol and prevent its distillation, at least in part. The yellow color of some of the distillates would indicate the possible presence of nitro-phenol. It was later found that to some extent the difficulties experienced were due to the use of too large a quantity of phosphoric acid. By reducing the amount of acid to a few drops much better results were obtained, but still in some cases the trouble mentioned could not be entirely overcome without omitting the acid. Since the liability to error was so apparent, and its cause so clearly shown, a substitute for phosphoric acid was sought. Some "weaker" acid, one that would not displace nitric acid and would still decompose any phenolates present, was desirable. Citric acid and acetic acid were both used, but with any appreciable amount of either, nitric acid could be detected in the distillate. Carbonic acid then seemed to be the last resort. To determine the extent of its applicability the following experiments were carried out:

The purity of a sample of crystallized phenol was determined by the U. S. P. assay and found to be 98.38 per cent. It was then distilled in the same apparatus as used in the work on tablets and found to be 98.18 per cent. pure.

Weighed quantities of this specimen were then taken and varying amounts

of potassium hydroxide V. S. added. The mixture was then distilled in a current of steam. The results are tabulated below :

Phenol taken.	Cc. $\frac{N}{1}$ KOH added.	Phenol recovered.	Per cent.
.0461 Gm.	.46 = theory.	.0167	36.22
.0651 Gm.	.65 = theory.	.0197	30.26
.0318 Gm.	.30 = theory.	.0079	24.84
.0520 Gm.	1.04 = 2 times theory.	.0057	10.96
.0430 Gm.	1.28 = 3 times theory.	.0034	7.91
.0602 Gm.	3.00 = 5 times theory.	.0025	4.15

Experiments similar to above, except that the phenol solution was saturated with  $\text{CO}_2$  and distilled in a current of  $\text{CO}_2$  were then made with the following results :

Phenol taken.	Cc. $\frac{N}{1}$ KOH added.	Phenol recovered.	Per cent.
.0199 Gm.	.2 = theory.	.0195	97.97
.0365 Gm.	.36 = theory.	.0356	97.52
.0116 Gm.	.12 = theory.	.0116	100.00
.0367 Gm.	1.00 = 3 times theory.	.0358	97.54
.0387 Gm.	1.16 = 3 times theory.	.0372	96.12
.0307 Gm.	1.2 = 4 times theory.	.0300	97.72
.0375 Gm.	1.88 = 5 times theory.	.0363	96.81

On a mixture of phenol, opium, aromatic powder, and bismuth subnitrate the following results were obtained. In no case could nitric acid be detected in the distillate, even with the diphenylamine test :

Phenol added.	Phenol found.	Per cent. recovered.
.0326 Gm.	.0335 Gm.	102.80
.0263 Gm.	.0268 Gm.	101.90
.0333 Gm.	.0338 Gm.	101.50

In a mixture of the same composition as claimed for the tablets and containing 7.21 per cent. phenol, 7.11 per cent. and 7.07 per cent. phenol was found.

The method in detail is as follows : The substance containing the phenol was placed in a round-bottomed distilling flask and water sufficient to cover it was added. The flask was connected by means of a double perforated rubber stopper, on the one hand, with a Liebig condenser, and on the other with a tin reservoir containing water. A current of carbon dioxide was then passed from a Kipp generator through the reservoir and distilling flask for fifteen minutes or more. (In the case of the known mixtures of phenol and potassium hydroxide V. S., phenolphthalein was added and carbon dioxide passed until colorless, about five minutes being sufficient.) The water was then heated to boiling and the distillation continued, a brisk current of carbon dioxide \* passing through the apparatus continually

\* Simple saturation with carbon dioxide will not liberate all the phenol, but a stream

until 250 Cc. \* of distillate was obtained. Of this distillate 50 Cc. was taken and placed in a 250-Cc. glass-stoppered flask, 25 Cc. of standard bromine solution added, and the mixture acidulated with 5 Cc. hydrochloric acid U. S. P.; the mixture was shaken frequently during one-half hour, and then 5 Cc. potassium iodide T. S. was quickly introduced and the mixture well shaken. The stopper and neck of the flask were rinsed with water, a small amount of chloroform added, and the iodine titrated with standard sodium thiosulphate V. S.

The following experiments show that the apparatus in use gave satisfactory results. A solution of phenol was prepared by dissolving a weighed quantity of a specimen of phenol (crystals) in water; varying amounts of this solution were taken and titrated by the U. S. P. method:

Weight of phenol (crystals) taken.	Phenol found.	Per cent. phenol in specimen.
.0379 Gm.	.0374 Gm.	98.68
.0303 Gm.	.0298 Gm.	98.37
.0076 Gm.	.0074 Gm.	97.36

Next varying amounts were submitted to the steam distillation and the phenol estimated in the distillate:

Weight of phenol (crystals) taken.	Phenol found.	Per cent. phenol in specimen.
.0076 Gm.	.0074 Gm.	97.36
.0152 Gm.	.0149 Gm.	98.04
.0379 Gm.	.0370 Gm.	97.63

Since the tablets under examination varied widely in the amount of phenol which they contained, a uniform excess of bromine solution could not readily be added. Experiments were made to determine to what extent variations in the amount of phenol present influenced the final results. A solution of phenol was prepared and assayed by the U. S. P. method, which showed the phenol to be 96.4 per cent. pure. Varying amounts of this solution were taken, water added to make 50 Cc., and 25 Cc. standard bromine solution added and the titration made as before. The results are here tabulated:

of the gas must be passed during the distillation; when in an experiment the supply of carbon dioxide was cut off as soon as the saturation was complete, and then the distillation continued, only 88.64 per cent. of the phenol was recovered in one case, 90.48 per cent. in another, and 86.68 per cent. in a third.

\* If 250 Cc. of distillate is collected, as shown in an experiment with pure phenol, the first 100 Cc. of distillate in one case contained 96.48 per cent. of the phenol taken and in another 97.22 per cent.; with a mixture of phenol, opium, bismuth subnitrate, and aromatic powder, and containing 7.21 per cent. phenol, the first 100 Cc. distillate contained 98.61 per cent. of the phenol present.

Phenol taken.	Vol. of solution.	Cc. bromine V. S. added.	Cc. bromine V. S. consumed.	Phenol found.	Per cent. of phenol found.
.0051 Gm.	50 Cc.	25.95	3.14	.0049 Gm.	96.07
.0102 Gm.	50 Cc.	25.95	6.21	.0097 Gm.	95.10
.0153 Gm.	50 Cc.	25.95	9.38	.0146 Gm.	95.43
.0204 Gm.	50 Cc.	25.95	12.55	.0195 Gm.	95.58
.0255 Gm.	50 Cc.	25.95	15.82	.0246 Gm.	96.47
.0306 Gm.	50 Cc.	25.95	18.79	.0292 Gm.	95.43
.0357 Gm.	50 Cc.	25.95	22.06	.0343 Gm.	96.07
.0408 Gm.	50 Cc.	25.95	25.13	.0391 Gm.	95.83

It is evident from this that sufficiently accurate results will be obtained even when widely varying amounts of phenol are contained in the distillate, and accordingly the distillation method, in which phenol is liberated from an alkaline solution by means of carbon dioxide, was adopted for the work in hand.

The following experiments further demonstrate that the method is generally applicable: To .1535 Gm. phenol 1 Gm. sodium sulphite was added and the distillation carried out as described above (but without the use of either phosphoric acid or carbon dioxide); 94.73 per cent. was recovered. In a duplicate, 96.54 per cent. was recovered.

The same experiments were repeated, but with the addition of phosphoric acid. A single drop of acid liberated sulphur dioxide, and in one estimation 167 per cent. phenol was indicated. In a second experiment 1 Cc. phosphoric acid was added; here no bromine was liberated when after treating the distillate with bromine solution, hydrochloric acid was added, the sulphur dioxide which had passed over being sufficient to reduce the bromine as fast as formed, leaving none to react with the phenol.

Finally, to .1268 Gm. phenol was added 1.2 Cc. tenth-normal potassium hydroxide and 1 Gm. sodium sulphite. The mixture was saturated with carbon dioxide and the distillation conducted as above described; 97.27 per cent. of the phenol was recovered. In a duplicate, 5 times the theoretical amount of potassium hydroxide was added; 97 per cent. of the phenol was recovered.

When the phenol mixture contained sodium nitrite, phosphoric acid could not be used at all; having the solution made slightly alkaline and saturating with carbon dioxide, in one experiment 95.1 per cent. of the phenol was found; in another experiment 94 per cent. of the phenol was found.

When potassium bromate (an impure specimen which when acidulated ever so slightly with phosphoric acid liberated bromine) was added to phenol and the mixture made slightly alkaline and distilled with carbon dioxide, 96.61 per cent. of the phenol was recovered.

The conclusions to be drawn from these experiments are: First. The method of the U. S. P. for the valuation of phenol is entirely satisfactory,

and also may be applied when the volume of the phenol solution is as great as 50 Cc. and the amount of phenol present sufficient to absorb from 10 to 90 per cent. of the bromine solution added. Second. Phenol can be completely removed from a solution containing much potassium hydroxide by first saturating with carbon dioxide and then distilling with steam in a current of carbon dioxide. Third. Under these conditions as much as .150 Gm. phenol is found in the first 100 Cc. distillate. Fourth. The presence of such bodies as sulphites, bromates, and nitrates does not affect the estimation of phenol by this method.

The Chair called for discussion on the paper just read.

Mr. Beringer, of New Jersey, asked the author if he had ever tried this method in the estimation of creosote and guaiacol. Mr. Clark answered that he had not.

Mr. Asher said that he had never done any special work with phenol, as outlined by Mr. Clark, but had had experience with bismuth subnitrate, and would suggest that the use of carbon dioxide was very tedious, and he believed if sodium carbonate were used it would serve the purpose better. Mr. Clark stated that that would not decompose the phenolates.

Mr. Asher, continuing, said that upon the addition of the soda you have your  $\text{CO}_2$  developed in the solution. It showed that all the oxidizing agents had been used with varying results, and that the presence of the sodium carbonate would offset that condition. He described some work he had done with subnitrate, and said that sodium carbonate had overcome some of the difficulties.

Mr. Puckner said that it might be interesting to mention some experiments they had been making in the laboratory of the American Medical Association. The iodine absorption method is not generally used for that particular phenol, but for other phenols. Their experiments seemed to show that the bromine absorption gives correct results, regardless of the quantities of the reagent used. As long as iodine is used for the estimation very close attention to details is necessary. They have been making experiments in the estimation of salicylic acid, by the bromine and iodine absorption methods. While in the case of iodine, close attention to details is necessary, that does not arise when bromine is used. So that possibly the bromine absorption method should replace the iodine absorption method in the estimation of phenols generally.

The Chair said the time had now come for adjournment until the afternoon session, and a recess was taken accordingly.

#### SECOND SESSION—THURSDAY AFTERNOON, SEPTEMBER 10, 1908.

Acting Chairman Vanderkleed called the Section to order at 3:30 p. m., and said he had just received a letter from Chairman Coblenz, stating

that, whilst his eyes were much improved, he found it impossible to continue his journey, and he would, therefore, not be present at the meeting at all. He said Mr. Coblentz had sent by mail, thinking it would be of some interest to the section, a sample of artificial camphor, labeled "Refined camphor, perleform," and Mr. Vanderkleed said he thought it might be of interest to add this to the section exhibits.

The Chair then called on Mr. Frank R. Eldred to read a paper he had prepared on the sampling of drugs. Mr. Eldred presented the subject as follows :

#### SAMPLING OF DRUGS AND PREPARATION FOR ASSAY.

BY FRANK R. ELDRED.

Probably on account of the unattractiveness of this work, it has received very little attention, yet it is at the foundation of practical analytical work. As far as I have been able to determine, the Proceedings of this Association contain only one contribution to the subject of sampling.\* A few papers bearing upon the subject have been presented before the various chemical societies,† but these do not treat on the sampling of drugs.

In presenting this paper, I neither lay claim to special knowledge of the subject, nor expect to suggest methods for overcoming the difficulties of sampling. I simply wish to present some personal experiences in the hope of arousing greater interest in the subject. Much could be said in regard to sampling other materials used in chemical and pharmaceutical work but I intend to confine my remarks to crude vegetable drugs. Probably no other class of materials is more difficult to sample accurately, and a large amount of careless or inaccurate sampling has done much to discredit the chemical valuation of crude drugs.

While it is very necessary that every effort be made to improve our assay methods, it should not be forgotten that, so far as crude drugs are concerned, these methods are of practical value only as a means of determining the strength of large lots; and results are worse than useless, unless obtained by assaying truly representative samples. It is hardly probable that any of our present assay methods give rise to errors of as great magnitude as the errors of sampling.

It may seem that I am uttering platitudes, but experience has convinced

---

\* Outlines for sampling of Drugs and Chemicals. Lyman F. Kebler, Proc. Am. Pharm. Assn, 1905, 53, 348.

† J. Soc. Chem. Ind. 1883, 2, 441.

" " " " 1884, 3, 210, 345, 356.

Pattinson, J. Soc. Chem. Ind. 1884, 3, 17.

Tatioc, " " " " 1884, 3, 307.

Tate, " " " " 1884, 3, 339.

Griffin, " " " " 1905, 24, 183.

Shimer & Reifsnyder, J. Am. Chem. Soc. 1893, 15, 260.

Keller, J. Am. Chem. Soc. 1897, 19, 243.

me that as a rule very little thought is given to this subject and it is to be hoped that investigation along this line will establish more firmly the buying and selling of drugs on the results of chemical assays. At present sampling is the convenient scapegoat which must bear the brunt of all differences in results and all disputes in regard to quality, and there is no denying the fact that it is often responsible for both. On the other hand every dealer seeks to recommend his goods by submitting "average" and "representative" samples.

To show the light in which this subject is regarded by dealers in drugs, I wish to present the following extracts from letters :

"We are in receipt of your communication relative to BELLADONNA LEAVES, and in response would say that it is simply another example of the variation of tests which appears in the same parcel of crude drugs. In all probability another test would demonstrate a different result, possibly higher. In order that the goods enter this country, the Government had to demonstrate that the result of their analysis proved the goods to be U. S. P. Probably, however, a dozen other tests would each show a different result."

Referring to ipecac, another dealer says :

"No matter how carefully samples are drawn we find that no reliance can be placed upon the probability that two such samples drawn at the same time (or one sample divided) will bring back the same assay reports from two chemists, or for that matter even from the same chemist. Our own assays are carried out in triplicate and sometimes in quadruplicate; but we are frank to say that for practical purposes we pay little or no attention to the results."

Many similar expressions could be quoted but these are sufficient to show how little reliance is placed on sampling by dealers who handle large quantities of drugs. This attitude is not without reason, but most of the difficulties could be traced to careless or faulty methods of sampling. The small size of samples submitted is a frequent cause of misleading results. What seems to be the extreme limit in this direction came to the writer's notice a few days ago. A small envelope containing about a half gram of potassium bicarbonate was received as a sample. The envelope was sealed but had a small gelatin window in one side through which the contents could be inspected, thus avoiding even the task of opening the envelope. Surely if every one was so thoughtful, the chemists' labors would be greatly reduced. This is an extreme case but samples of drugs so small that there is scarcely enough material for assaying are often submitted. Such samples cannot be expected to be representative. It is true that in many instances the expense of submitting samples of sufficient size would be considerable, but it would be much more satisfactory to both buyer and seller, if larger samples were used and the expense shared between them.

Unfortunately only a few direct tests of sampling have been made in the laboratory with which I am connected, but manufacturing operations con-



firm in a general way the accuracy of most of our sampling. The following results show some of the possibilities of error and of accuracy in sampling. A small sample (about 100 Gm.) was taken from three bales of ipecac, no care being used to make the sample representative. It contained 1.62 per cent. total alkaloids. After grinding and mixing the whole lot it was found to contain 2.19 per cent. total alkaloids. However, ipecac can be accurately sampled; a sample submitted contained 2.47 per cent. alkaloids, the lot of several bales represented by this sample was carefully sampled and found to contain 2.48 per cent. alkaloids. A sample from another source contained 2.7 per cent. total alkaloids; the lot represented by this sample was sampled, over 500 Gm. being taken from each bale; this sample assayed 2.67 per cent. The whole lot was then ground and mixed; it was found to contain 2.676 per cent. alkaloids.

Six large bales of belladonna leaves were sampled at two different times: large samples were taken and assays made in duplicate. The duplicate assays on each sample averaged 0.245 per cent. A single bale when ground was found to contain 0.29 per cent. total alkaloid.

It is thus seen that accurate sampling of crude drugs is a difficult but not hopeless undertaking. It is our intention to study this subject further as we have opportunities to do so. It would also be very desirable if other chemists would investigate this subject; in this way valuable data would become available, and some uniformity in methods might result.

Owing to the nature of the materials, all crude drugs must be sampled by hand. Our practice has been to take a sample of about 500 Gm. from each bale of leaves, roots, barks, etc., and a small sample from parcels of small seeds or other fine material. In making up this sample, portions are taken from various parts of the parcel, both from the surface and from the interior.

After obtaining a representative sample its preparation for assay is a matter of importance and of some difficulty. The writer has been unable to find a suitable mill for grinding drugs for assay where a large number of samples are to be ground. Such a mill should grind rapidly to a No. 60 or No. 80 powder, be easily cleaned, and there should be no loss of material. For the final fine grinding no satisfactory mill, except a small hand mill, has been found. The large sample is first roughly ground, thoroughly mixed and quartered, rejecting two quarters opposite one another, the remainder is again thoroughly mixed, and the process repeated until the sample is reduced to appropriate size. The small sample is ground on a hand mill until all passes through a screen of proper mesh; a remnant sometimes remains which cannot be ground fine enough in the mill, this is further reduced in a small iron mortar. Drugs of loose texture are ground to a No. 60 powder, and harder and denser drugs are ground to a No. 80 powder. Some drugs, such as *nux vomica*, *ignatia*, *aconite root*, *jalap*, etc., are first reduced in a large iron mortar, with a

very heavy pestle suspended by a spiral spring ; samples of asafetida are beaten to a uniform mass in the same mortar.

This subject should receive sufficient attention to develop uniform, accurate methods and to determine what degree of accuracy may be expected in sampling.

The Chair stated that in view of the fact that Mr. Eldred's three papers as noted on the program were of such a varying nature, he thought that discussion had better be had upon them separately, and invited discussion on the paper just read.

Mr. Francis said that it so happened that he had for a good many years been looking for this mill that Mr. Eldred described in his paper. He had tried every form of mill on the American market, and had finally evolved a mill according to his own ideas, and had tried to get the manufacturers to produce it, but our own manufacturers have been so busy, and turn out their work on such a large scale, that none of them would undertake a mill on such a small scale. He finally ordered a little centrifugal mill, having a grinding surface of some six inches, from a large German manufacturer, and he could almost say it would grind anything from soap to hay. There would sometimes be a little fibrous matter left, but for grinding samples from one ounce to five or six pounds it was fine. It was readily cleaned, and the operators could brush out every particle of the sample drug in half a minute, and the mill would be clean, ready for use again. He had used this mill for jalap and all kinds of roots and barks. With jalap it must be broken up to the size that the mill can handle.

The Chair asked if this mill would grind gelsemium and nux vomica, and Mr. Francis answered in the affirmative.

Continuing, Mr. Francis said the mill could be gotten either as a hand-mill or for power, but advised the latter. He did not remember the name of the German manufacturer, but could probably get hold of it, and he offered to take the name of any member present who desired such a mill, and to put them in touch with the manufacturer.

Mr. Richtmann, of Florida, said that the manufacturer of this mill was a man named E. Grumbach, but he did not remember his address at the moment. The Department of Agriculture has one of these mills, and it has proved a very satisfactory piece of machinery, for purposes of that kind, where the material is limited. The operator wants to be sure that all the material put in the mill is gotten out of it. He said different sieves had to be used to get the different degrees of fineness, but that was a simple matter.

The Chairman said that this was one of the most important things in working with the sampling and assay of drugs. He had had the same experience that the other gentleman had, and, like Mr. Eldred, had not been able to find a satisfactory solution. He would like very much to get the address of the German manufacturer of this mill.

Mr. Kebler said he had been interested in this sampling question for a good many years, and had written a paper on the subject and presented it at one of the meetings of the Scientific Section of this Association some years ago. The conditions of sampling are different at different places, he said, and it would seem to be advisable if men who have need of sampling would get together and formulate some scheme of uniform sampling. The Government was working on the problem now to get uniform methods for sampling the drug products imported at the various ports of entry in this country. It is a comparatively easy matter for the man versed in the quality of drugs to do this, because he knows what to go after; but it must be remembered that the analyst can not do all of this work himself, and it must be left to others, who do not have the knowledge. That is where the chief trouble comes in, he believed.

Mr. LaWall, in this connection, said that it is a very different matter, the sampling of five or six bales of drugs and the sampling of 200 bales. Take *asafetida*, for instance. The sampling of forty cases of *asafetida* so as to get even six or eight samples instead of making forty different assays of the lot, is quite a difficult undertaking. He did not know anything as difficult to sample as *asafetida*; it is really a heartrending task.

Mr. Charles E. Caspari asked Mr. Eldred how he sampled opium. Mr. Eldred replied that the remarks of Mr. LaWall would apply to that. In the sampling of opium, if it is in large lumps, they take about every other lump, and when it comes in small lumps, every fifth or sixth lump, depending on the size of the lump; and the sampling is done with a little steel instrument with a prong at right angles, so it can be pushed into the lump readily, except the hardest variety, and then by turning it around a little piece of opium fairly representative of the lump, may be drawn out. In that way they had been able to get quite accurate results. That would be out of the question with large quantities, however.

Mr. Kebler thought the best method of sampling opium was the old-school method; nothing ahead of that to-day, cutting out a conical section from the lump. The analyst should teach his helper how to take out these samples he said; the chemist cannot do that himself.

Mr. LaWall said that in the sampling of opium the analyst could afford to sample every case and make a separate assay. The best method, as Mr. Kebler had said, was that proposed by Dr. Squibb, to take every fifth piece out and sample it. As to *asafetida*, he said that when the analyst opens up a case in the appraiser's store, and it is all up in one end of the case, and he takes a hatchet and breaks the hatchet at the first blow, he looks at it in despair. He did not know of any satisfactory way to get a sample of *asafetida* that was in that condition.

The Chair suggested that this, after all, was a commercial question, and did not have much bearing on the quality of the finished product, because the finished product, itself, must be assayed and standardized afterwards.

So it is largely a question of price,—of commerce,—and does not affect the therapeutics so much.

The Chair then called for a paper by Mr. Eldred and Mr. Pence on the Estimation of Hydrastine, and Mr. Eldred presented the paper as follows:

# NOTES ON THE ESTIMATION OF HYDRASTINE.

BY FRANK R. ELDRED AND C. M. PENCE.

In a recent paper Puckner\* shows that the method of the 8th revision of the U. S. Pharmacopœia for the assay of fluidextract of hydrastis gives results which are too low. We had noted, soon after the publication of the Pharmacopœia, that the official method gave lower results than methods in use in our laboratory. Although convinced that the results obtained by the official method were too low, it was adopted for standardizing our fluidextract in order to comply with the pharmacopœia requirements. However, as the results obtained by Puckner† in assaying non-alcoholic fluid golden seal were somewhat lower than the results obtained in our laboratory, the following experiments were made to test this point and also to compare Puckner's method with the ordinary ether extraction method.

A fluidextract of hydrastis was assayed in four different ways, duplicate results being obtained in all cases.

## 1. Puckner's method.

The assay was made in the manner described by Puckner‡ except that a fourth ether extraction of the alkaline solution was made and the hydrastine obtained by this fourth extraction was weighed separately.

Three extractions.....	1.960 Gm. per 100 Cc.	1.968 Gm. per 100 Cc.
Fourth extraction.....	.044 " " " "	.042 " " " "
Total hydrastine .....	2.004 " " " "	2.010 " " " "

The alkaloid obtained by this method is impure as shown by its softening at 110° and melting completely at 127° C. A much purer alkaloid is obtained by washing the acidulated solution with ether, but the results are then too low. In our experience the iodide precipitate retains hydrastine when washed in the manner directed by Puckner.

## 2. Ether extraction method.

In this method 5 Cc. of fluidextract were placed in a separator with 10 Cc. of 2 per cent. sulphuric acid and 30 Cc. of water; this acid solution was washed with four portions of ether, then made slightly alkaline with ammonia and extracted with four portions of ether, the alkaloid obtained in the fourth portion being weighed separately.

Three extractions.....	2.150 Gm. per 100 Cc.	2.174 Gm. per 100 Cc.
Fourth extraction.....	.027 " " " "	.018 " " " "
Total hydrastine .....	2.177 " " " "	2.192 " " " "

\* The Estimation of Hydrastine by W. A. Puckner, Pharm. Rev. 1908, 26, 132.

† Loc. cit.

‡ Loc. cit.

The alkaloid obtained by this method softened at  $111^{\circ}$  and melted at  $130^{\circ}$  C.

### 3. Method of the U. S. Pharmacopœia.

Three extractions.....	1.902 Gm. per 100 Cc.	1.892 Gm. per 100 Cc.
Fourth extraction.....	.030 " " " "	.046 " " " "
Total hydrastine .....	1.932 " " " "	1.938 " " " "

This alkaloid softened at  $118^{\circ}$  and melted at  $128^{\circ}$  C.

4. Method of the U. S. Pharmacopœia except that the hydrastine solution was acidulated with sulphuric acid and washed with four portions of ether; then made alkaline and extracted with four portions of ether.

Hydrastine found.....	1.776 Gm. per 100 Cc.	2.786 Gm. per 100 Cc.
-----------------------	-----------------------	-----------------------

This alkaloid melted at  $130^{\circ}$  C. without previous softening.

A lot of fluid golden seal, non-alcoholic, was assayed in duplicate by method 2 before adding the glycerin; it was then accurately adjusted to 1.25 Gm. per 100 Cc. by the addition of glycerin and water. On assaying this dilution by method 2, 1.244 Gm. of hydrastine per 100 Cc. was obtained. The same preparation was assayed by Puckner's method with a result of 1.186 Gm. per 100 Cc. The alkaloid obtained by method 2 began to soften at  $65^{\circ}$  and melted completely at  $122^{\circ}$  C., thus indicating the presence of glycerin. That the alkaloid obtained in assaying a solution containing glycerin is probably contaminated with glycerin was also shown by shaking a mixture of water and glycerin containing 5 per cent. of the latter with three portions of ether of 30 Cc. each; the residue remaining on evaporating the ether amounted to 0.9 mg.

These results show that it is necessary to use at least four portions of ether in order to extract all the hydrastine; also that the acid solution of hydrastine must be washed with ether to remove impurities which will otherwise contaminate the extracted alkaloid. The errors caused by neglecting these two precautions tend to balance one another. Results obtained by the official method are too low even when four portions of ether are used for extraction, and results obtained by Puckner's method are also too low unless the iodide precipitate is thoroughly washed until free from hydrastine and four portions of ether are used to extract the hydrastine from the alkaline solution.

Attempts were made to titrate hydrastine and it was found that solutions of pure hydrastine could be accurately titrated using methyl orange as indicator. In order to exactly determine the end point, two blanks were prepared for the purpose of comparison, containing the same amount of methyl orange as the solution to be titrated; to one of these blanks one drop of  $n/20$  acid was added. After dissolving the hydrastine in an excess of  $n/20$  acid, alkali was run in until a color between the colors of the two blanks was obtained. When this method of titration was tried on alkaloidal residues obtained in assaying golden seal the coloring principle asso-

ciated with the alkaloid obscured the end point as it acquired a red tinge on becoming alkaline.

The Chair called for discussion on the paper just read.

Mr. Puckner said that the method of assay which he had used for hydrastis was adopted, not because he believed it would give more accurate results, but because in agreement with the methods adopted for other drugs it did away with aliquot parts, and because it was more convenient. As regards the extraction of glycerin by ether he was aware, of course, that some of the glycerin was carried over by the ether, but long-continued drying expelled the glycerin, so that in the end the alkaloid was fairly pure.

The Chair said if there was no further discussion on this paper he would call on Mr. Eldred to read his third paper, a paper by himself and Mr. Bartholomew, on the "Separation of Emulsions for Analysis." Mr. Eldred presented the subject as follows :

#### A NOTE ON THE SEPARATION OF EMULSIONS FOR ANALYSIS.

BY FRANK R. ELDRÉD AND W. C. BARTHOLOMEW.

Having had occasion to analyze several emulsions, various methods of separation were tried. Kebler & Hoover\* in a paper before this Section, review the scant literature on the analysis of emulsions and give detailed methods for their separation and analysis. It is difficult to outline any general method of analysis applicable to all emulsions, as the composition is so varied that nearly every emulsion presents a different problem. However, in the analysis of any emulsion the first step is the separation or breaking-up of the emulsion.

Great difficulty was experienced in separating emulsions quantitatively by the centrifugal method described by Kebler & Hoover;† but it was found that practically all emulsions could be separated, by the simple addition of alcohol, in such condition that the oils and emulsifying agents could be accurately weighed and examined.

The results given in the tables were obtained by the following method: After thoroughly mixing the emulsion, 25 Gm. are weighed in a 250-Cc. beaker, sufficient 95 per cent. alcohol (usually 100 Cc. to 150 Cc.) is added to effect the separation. After stirring well the mixture is filtered, with the aid of a filter pump, through asbestos in a tared Gooch crucible of about 50 Cc. capacity. Any material adhering to the beaker is transferred to the filter by means of alcohol. The residue in the crucible is extracted with ether in a Wiley's extractor. After extracting, the ether remaining in the residue is allowed to evaporate, the crucible is returned to the Wiley's apparatus, extracted with alcohol, dried and weighed. This residue consists of the emulsifying agents, free from oil, together with any

\* Method for the Analysis of Emulsions, by L. F. Kebler and Geo. W. Hoover. *Proc. Am. Ph. Ass'n.*, 1905; 53, 354.

† Loc. cit.

other substances present in the emulsion and insoluble in alcohol and ether. The alcohol and ether extracts are united with the original filtrate and evaporated to dryness in a tared beaker. The residue in the beaker is then extracted with several portions of ether which are evaporated in a tared beaker and the remaining oil (which will also contain any lecithin, volatile oils used for flavoring, and other ether-soluble substances present) is dried and weighed. The material remaining in the beaker after extracting with ether will contain the sugar, glycerin, sodium and potassium hypophosphites, and possibly other substances. Sugar and glycerin may be separated by a mixture of equal parts of absolute alcohol and ether.\*

The emulsions in Table 1 were made in the laboratory, all the ingredients being accurately weighed.

TABLE NO. 1.

No.	Kind of Emulsifying Agent.	Oil Added.	Oil Found.	Emulsifying Agent Added.	Emulsifying Agent Found.	Sugar Added.	Sugar Found.
1	Acacia .....	45.04%	44.8%	12.16%	12.31%	8.5%	8.47%
2	Tincture of quillaia ..	46.44%	46.4%	0.31%	0.31%	10.01%	10.4%
3	Irish moss .....	46.62%	46.54%	0.35%	0.32%	8.73%	8.65%
4	Casein .....	49.98%	49.54%	4.37%	4.13%	21.79%	21.9%
5	Starch, tragacanth and Acacia. ....	47.37%	47.38%	4.34%	4.16%	1.51%	1.52%
6	Dextrin .....	44.87%	44.1%	8.11%	7.76%	10.11%	10.17%
7	Egg yolk .....	47.3%	46.8%	1.3%	1.4%	8.29%	7.95%
8	Tragacanth .....	46.5%	46.47%	0.8%	0.85%	8.5%	9.08%
9	Soap .....	7.0%	6.95%	0.5%	0.48%		

In emulsion No. 1 the volatile material was determined by drying to constant weight on asbestos at 100° C. The amount of water present was 33.82 per cent.; the loss of drying 34.4 per cent. In emulsion No. 7 the oil of the egg yolk is included in the oil added and oil found. Under the head of emulsifying agent the amounts of vitellin are recorded. The amount of lecithin present was 0.7 per cent.; the amount found, by extracting the oil with alcohol and precipitating with acetone, was 0.6 per cent. The amount of glycerin present was 10.70 per cent.; amount found 10.9 per cent. Emulsion No. 9 was coal-oil emulsion intended for spraying purposes.

Alcohol was added to several of the above emulsions in proportion of 5 per cent. by volume, and was recovered by direct distillation after diluting with water. In no case did the result differ by more than 0.3 per cent. from the amount added.

Several proprietary emulsions were separated by this method, the results obtained on them being given in table No. 2. Nos. 1 and 2 could not be dried to constant weight owing to the loss of glycerin.

\* Com. Org. Analysis, Allen Vol. 2, part 1, p. 311.

TABLE NO. 2.

No.	Kind of Emulsion.	Amount of Oil.	Amount of Emulsifying Agent.	Amount of Sugar.	Amount of Glycerin.	Loss on Drying Per-cent.
1	Codliver Oil 50% by volume.....	45.65%	2.3%		16.04%	38.15%
2	Codliver Oil 50% by volume.....*	42.07%	9.12%	0.46%	21.26%	32.9%
3	Petroleum 33 $\frac{1}{3}$ % by volume.....	26.44%	2.43%		8.57%	61.76%

In tables 1 and 2 all results are expressed as percentages by weight.

In separating emulsions containing hypophosphites by this method calcium hypophosphite is found with the emulsifying agent and potassium and sodium hypophosphites with the sugar.

Mr. Francis asked the author how nearly his actual results agreed with his theoretical results. Mr. Eldred replied that he would read from his paper to show how close these results were. Mr. Francis said he meant whether it came within one-half, or one, or two per cent. Continuing, Mr. Eldred said that Emulsion No. 1, emulsion of cod-liver oil of the United States Pharmacopœia was prepared by weight—all ingredients being calculated to weight—so as to make the proportions accurate. The amount of oil added was 45.04 per cent., the amount found was 44.8 per cent., the amount of emulsifying agent (acacia) added was 12.16 per cent., the amount found, 12.31 per cent. The amount of sugar added was 8.5 per cent.; the amount of sugar found was 8.47 per cent. Mr. Eldred called attention to another case, where the result was just about as accurate as this. He said he would read the one prepared by using casein as an emulsifying agent. Oil added, 49.98 per cent.; oil found, 49.54 per cent.; emulsifying agent added, 4.37 per cent.; emulsifying agent found, 4.13 per cent.; sugar added, 21.79 per cent.; sugar found, 21.9 per cent. In adding these different ingredients they were dried, so that they were in about the same condition when used in preparing the emulsion as when dried after separation. Of course where starch is present this is not necessary. Taking these precautions, it was found the results in all these emulsions were as close as could be expected in determining such things. In sampling care was taken to thoroughly shake the emulsion before taking off the 25 Gm. for assay.

The Chair called for discussion on this paper, but none was offered.

The Chair stated that these several papers of Mr. Eldred and his associates would be received and referred to the Publication Committee in the usual way.

The Chair said that in going back to the papers of the morning session which had been omitted, he would now ask Mr. Army to read his paper on



the "Solution of Chlorinated Soda." Mr. Army presented his paper in abstract, the full text being as follows :

## SOLUTION OF CHLORINATED SODA.

BY H. V. ARMY AND O. H. DAWSON.

In the issue of the "American Journal of Pharmacy" for June, 1904, (page 258) Army and Wagner published a critique on the formula given for the manufacture of solution of chlorinated soda by the United States Pharmacopœia of 1890, showing that the formula given by that authority was impossible as far as the average manipulator was concerned.

It was shown that the Pharmacopœia demanded that the finished solution should contain 2.6 per cent. available chlorine ; that 1000 Gm. of solution should contain 26 Gm. available chlorine ; that this 26 Gm. available chlorine was to be extracted from 75 Gm. chlorinated lime, containing 35 per cent. available chlorine ; that, in other words, starting in with chlorinated lime equivalent to 26.55 Gm. available chlorine, this unstable substance was to be triturated with water in an open dish, filtered, warmed, filtered again, and yet during the entire process was to be but 25 Cgm. of chlorine ; less than 1 per cent. of total amount.

The paper further showed that it was practically impossible to secure in the open drug market a 35 per cent. chlorinated lime ; and that, with the utmost care, the strongest solution of chlorinated soda that the writers were able to obtain by the process of 1890, contained but 2 per cent. available chlorine, while the average strength was about 1.8 per cent. chlorine.

In preparing the last Pharmacopœia, the Committee on Revision took cognizance of this defect, and compiled a new formula. Starting with 90 Gm. of chlorinated lime, containing 30 per cent. available chlorine, the operator is to secure 1000 Gm. of solution of chlorinated soda containing 2.4 per cent. available chlorine : that is, starting in with a batch of chlorinated lime containing 27 Gm. available chlorine, the finished solution is to contain 24 Gm. of chlorine, thus permitting a loss amounting to over 2 per cent. of the chlorine involved.

In order to find out if this change would produce the results expected, three separate samples of Labarraque's Solution were prepared by the official process from chlorinated lime that had been carefully assayed and the finished solutions assayed by the pharmacopœial process.

Two assays of the chlorinated lime showed 26.64 per cent. and 26.73 per cent. available chlorine, and as this was below the pharmacopœial standard, the solutions were prepared from 10 Gm. of this chlorinated lime instead of the 9 Gm. directed by the Pharmacopœia.

*Sample I.* 100 Gm. Labarraque's Solution, was made by the process of U. S. P. VIII., and assayed by the official method.

*Assay.—*

(a) 7 Gm. solution took 40.1 Cc.  $\frac{N}{10}$  sodium thiosulphate V. S. = 2.005 per cent. chlorine.

(b) 7 Gm. solution took 40.3 Cc.  $\frac{N}{10}$  sodium thiosulphate V. S. = 2.015 per cent. chlorine.

(c) 7 Gm. solution took 40.3 Cc.  $\frac{N}{10}$  sodium thiosulphate V. S. = 2.010 per cent. chlorine.

*Sample II.* 100 Gm. Labarraque's Solution made by another student by the process of the U. S. P., VIII, (using, however, 10 Gm. of 26.7 per cent. chlorinated lime instead of 9 Gm. of 30 per cent., as directed).

*Assay.—*

(a) 7 Gm. Labarraque's Solution took 33 Cc.  $\frac{N}{10}$  sodium thiosulphate V. S. = 1.65 per cent. chlorine.

(b) 7 Gm. Labarraque's Solution took 33 Cc.  $\frac{N}{10}$  sodium thiosulphate V. S. = 1.65 per cent. chlorine.

*Sample III.* Made 1000 Gm. Labarraque's Solution as per U. S. P. VIII., using, however, 100 Gm. 26.7 per cent. of lime instead of 9 Gm. of 30 per cent.

*Assay.—*

(a) 7 Gm. Labarraque's Solution took 33 Cc.  $\frac{N}{10}$  sodium thiosulphate V. S. = 1.65 per cent. chlorine.

(b) 7 Gm. Labarraque's Solution took 32.9 Cc.  $\frac{N}{10}$  sodium thiosulphate V. S. = 1.645 per cent. chlorine.

(c) 7 Gm. Labarraque's Solution took 33 Cc.  $\frac{N}{10}$  sodium thiosulphate V. S. = 1.65 per cent. chlorine.

It will be seen from the figures just given that the official process does not yield a solution containing 2.4 per cent. available chlorine even when carefully conducted, and that, as adduced in the previous paper, the question of the quantity of solution made at a time is not a factor in the result.

It will be further noticed that the process of the present Pharmacopœia does not yield a stronger product than that of the Pharmacopœia of 1890, showing that increasing the quantity of chlorinated lime does not produce a proportional increase in the strength of the finished product; that the loss is due to volatilization of the chlorine during the manipulation in the open air.

While on the subject it might be mentioned that great care was taken to preserve the chlorine strength of the chlorinated lime; a fresh pound bottle being opened, assayed, the rest divided into portions of 15 Gm. and 150 Gm. respectively, each portion put into an appropriate bottle, which was then corked and sealed with wax until the time it was used. Furthermore, a sample was assayed after all the experiments were completed, when it was found to have dropped from 26.7 per cent. to 24 per cent. chlorine.

In this connection it is the opinion of the writers that the pharmacopœial demand for a 30 per cent. chlorinated lime is impractical. In the

previous article there was given testimony for two other investigators, showing that out of 42 samples of chlorinated lime examined, the strongest contained 31 per cent. chlorine, while one went as low as 11 one-hundredths of 1 per cent.

In the present investigation a sample pound bottle furnished by an eminently reputable firm, and stated by them to assay 30.03 per cent., when assayed by the writers, and that with most carefully standardized thiosulphate solution showed 27.35 per cent. available chlorine. Would it not, therefore, be wise to return to the standard of the Pharmacopœia of 1880—25 per cent.?

As mentioned in the previous paper, the defects of the process of manufacture of Labarraque's solution of the Pharmacopœia of 1890 (and the same might also be said of the present official process), not merely lack of chlorinated lime, but chiefly too much handling of the liquid containing the volatile substance, chlorine. With these defects in view the following methods of manufacture, resembling the formula of U. S. P., 1880, were tried.

*Modified Process A.—*

Chlorinated lime (26.7 per cent.)..... 12 Gm.  
Water. .... 40 Cc.

Put the lime direct into an 8 ounce wide-mouthed bottle, cork tightly, let stand with occasional shaking, for 24 hours.

Monohydrated sodium carbonate ..... 6.5 Gm.  
Cold water ..... 50 Cc.

Dissolve and pour into the chlorinated lime paste. Recork the bottle and shake. The resulting gelatinous mass is gently heated, and when sufficiently liquid, it is filtered.

While the green-yellow filtrate was of high strength (assay, 7 Gm. solution, took 61 Cc.  $\frac{N}{10}$  sodium thiosulphate V. S. = 3.05 per cent. chlorine), the yield was too small to make the process profitable.

*Modified Process B.*

In this process the treatment and quantity of the chemicals were exactly the same as in A, but the magma was diluted with enough water to make 110 Cc., and then filtered, when 43 Cc. of finished solution was obtained.

*Assay.—*

7 Gm. solution took 50.1 Cc.  $\frac{N}{10}$  sodium thiosulphate V. S.=2.505 per cent. chlorine.

7 Gm. solution took 50.2 Cc.  $\frac{N}{10}$  sodium thiosulphate V. S.=2.51 per cent. chlorine.

*Modified Process C.*

This process was identical with Process A, except that the precipitate on the filter was washed with enough water to make 90 Cc. filtrate.

*Assay.*

7 Gm. solution took 53.4 Cc.  $\frac{N}{10}$  sodium thiosulphate=2.67 per cent. chlorine.

7 Gm. solution took 53.3 Cc.  $\frac{N}{10}$  sodium thiosulphate = 2.665 per cent. chlorine.

The same process was used with ten times the quantity of chlorinated lime and of sodium carbonate, and 900 Cc. filtrate collected.

*Assay.*

7 Gm. solution took 57 Cc.  $\frac{N}{10}$  sodium thiosulphate = 2.85 per cent. chlorine.

7 Gm. solution took 56.6 Cc.  $\frac{N}{10}$  sodium thiosulphate = 2.83 per cent. chlorine.

It will be seen that Process C not only furnishes a satisfactory yield, but that the product is much stronger than even the pharmacopœial requirement. In fact, it would seem that the formula could be recast, so as to obtain 100 Cc. filtrate in one case, and 1000 Cc. in the other.

But it must be borne in mind that a formula like this must be adjusted for the *average* operator, and where extraordinary care is not bestowed, 90 Cc. of filtrate is more apt to yield a product of pharmacopœial strength than would 100 Cc.

Thus the above formula recently entrusted to one of our students yielded a product assaying 2.45 per cent. chlorine.

Since performing the experiment just cited, it has been found that the solutions made in the proportion of 1.2 Gm. chlorinated lime and 6.5 Gm. monohydrated sodium carbonate contain lime salts; hence the amount of sodium carbonate should be increased to at least the proportion directed in the official formula. The latter calls for 6.5 Gm. monohydrated sodium carbonate, and 9 Gm. chlorinated lime; so if 12 Gm. of the lime combination is used, the amount of sodium carbonate should be increased to 8.7 Gm.

In view of our food and drug laws, state and national, the instability of chlorinated lime and of solution of chlorinated soda, is a menace to every dispenser of these two compounds. It is useless for the retailer to comfort himself with the assurance that no food official would prosecute the seller of these unstable products, nor is it wise to dismiss the subject with the short answer that Labarraque's Solution is rarely called for. The fact still remains that 30 per cent. chlorinated lime, and 2.4 per cent. Labarraque's Solution are official; that these strengths are practically never possessed by the chemicals dispensed by the retailer; and that unless other strengths are distinctly stated on the label, it is understood that the products are of pharmacopœial strength.

To the writers the only apparent way out of the dilemma, as far as chlorinated lime is concerned, will be the reduction of the official strength of that chemical to 25 per cent. at the next pharmacopœial revision; and as for solution of chlorinated soda, it should be freshly prepared by the pharmacist, and that by a modified formula, such as suggested in this paper and from chlorinated lime of unimpeachable quality.

In this connection the writers suggest to those wholesalers who specialize in chlorinated lime, the advisability of dispensing same in 12 Gm. lots in sealed glass tubes, similar to those used for amyl nitrite. By having the tube long enough, it should be possible to use the heat necessary to seal the tube without unduly heating the chemical, and this device may prevent loss by volatilization. That the chemical deteriorates even when sealed with paraffin in cork or glass-stoppered bottles, the data found in this article clearly show.

The quantity, 12 Gm. of chlorinated lime, is suggested as affording a convenient basis for making up 100 cubic centimeters of Labarraque's Solution by the modified formula suggested in this paper.

*Pharmaceutical Laboratory, Cleveland School of Pharmacy.*

The Chair called for discussion on the paper just read.

Mr. Dunning said, in reference to the preparation of this solution, he greatly favored the addition of a hot solution of sodium carbonate to the mixture of chlorinated lime with water and filtering immediately. If the filtrate from the mixture of chlorinated lime and water be added to the sodium carbonate solution, as directed by the Pharmacopœia, a very finely divided precipitate is produced, which does not settle readily and the solution is not easily filtered off from the magma.

Mr. LaWall corroborated Mr. Arny's experience with the old formulas. In 1893 he and Mr. Kebler had had occasion to make about a barrel a day of this substance for a month, and they had found the only method of satisfactory procedure was along the line of Mr. Arny's paper. There was a flood condition in Pennsylvania, and the Board of Health had called on them to supply a large quantity of chlorinated soda, and they had used this method. They had found any other manipulation would give a very low result.

Mr. Dunning said that his firm had furnished to a large hospital at one time a barrel a week for several weeks, and during this time he had come to the conclusion that the U. S. P. method was not satisfactory when preparing large quantities of the solution.

The Chair said the paper would take the usual course, by consent, and it was so ordered.

The Chair then called on Mr. Dunning to read in abstract his paper on "Proteid Compounds of Heavy Metals." Mr. Dunning said he did not see how he could abstract the paper very well, but it was not long, and he would abstract it wherever it was possible. He then presented his subject as follows:

#### PROTEIN COMPOUNDS WITH THE HEAVY METALS.

BY H. A. B. DUNNING.

As the title of my paper suggests my intention was to discuss certain metallic compounds formed by bringing together some of the heavy metals.

with fresh albumen, and albumen which has been peptonized, laying particular stress upon the iron combinations.

I find by referring to the 1905 Proceedings A. Ph. A. that I discussed these compounds once before in a general way, stating that certain soluble salts of the heavy metals, copper, mercury, silver and iron are not precipitated in fairly dilute solution in the presence of definite amounts of peptone upon the addition of an excess of alkali hydroxide. These solutions may be evaporated to syrupy consistency and scaled.

The particular object of this paper is to present for comment and study my observation of the conduct of freshly precipitated iron and albumen, and iron and peptone compounds towards certain chemical substances made use of for the purpose of converting them into soluble compounds. As will be observed in the following experiments several different methods of producing the iron albumen and iron peptone compounds are used.

Each time the action of the different chemical substances was observed a definite quantity of the chemical was allowed to act upon a definite amount of the iron compound prepared separately, as it is not practicable to make a large quantity and experiment with portions of same with accuracy in regard to quantity.

#### IRON ALBUMEN COMPOUNDS.

##### No. 1.

Egg albumen .....	35 Gm.
Solution of iron oxychloride .....	35 Gm.
Solution of sodium hydroxide 10 p. c. q. s.	

The mixed solution of albumen and solution of iron oxychloride were neutralized with the soda solution; the precipitate was washed by decantation, collected on a filter and drained.

The precipitate is soluble in sodium hydroxide solution as directed by N. F.

It is not soluble to any extent in sodium citrate solution 5 Gm. to 15 Cc. or stronger solution by heat, slightly soluble in ammonium citrate solution B. P. 15 Cc., by heat.

Imperfectly soluble in solution of manganese citrate 2.5 Gm., sodium citrate 5 Gm., by heat.

Partially soluble in manganese citrate 5 Gm. mixed with 15 Cc., water by heat.

Some difficulty was observed in dissolving the precipitate from old opalescent solutions of oxychloride of iron when using sodium hydroxide as solvent.

##### No. 2.

Egg albumen .....	30 Gm.
Solution of ferric chloride .....	15 Gm.
Ammonia water 10 p. c. ....	12 Cc.
Sodium citrate .....	5 Gm.
Sodium hydroxide q. s.	

The ammonia water is added to the solution of ferric chloride gradually, and in portions, the mixture being stirred after each addition until the precipitate is redissolved. This solution is diluted and mixed with egg albumen, neutralized and collected as in above experiment.

This is a modification of Harrison's method for preparing iron peptonate, and in a note by the editor of the A. Ph. Association Bulletin, was suggested for the iron albuminate solution also.

Precipitate does not dissolve in sodium citrate solutions, by heat, although there was slight coloration of filtrate from the mixture.

Not soluble in sodium hydroxide solution, although this statement is somewhat doubtful.

Slightly soluble in ammonium citrate solution by heat.

Imperfectly soluble in manganese citrate with sodium citrate by heat.

#### No 3.

Albumen .....	25 Gm.
Iron chloride.....	5 Gm.
Sodium hydroxide q. s.	

Precipitate collected in usual way was not soluble to any extent in sodium hydroxide, sodium citrate or ammonium citrate.

#### IRON PEPTONE COMPOUNDS.

Of the vast number of experiments performed during the past five years for the purpose of effecting a permanently soluble compound, I will offer for consideration only those which lead to definite conclusions :

#### No. 1.

Egg albumen (peptonized) .....	25 Gm.
Solution of oxychloride of iron.....	40 Cc.
Sodium hydroxide, q. s.	

Precipitate was formed, washed and collected in same way as albumen compound.

Precipitate is insoluble in sodium hydroxide solution, either when a perfectly fresh or an old solution of oxychloride of iron was used, when employing strength solution and method directed in N. F.

Insoluble in sodium citrate solution of different strengths by heat.

Soluble in sodium citrate and ammonium chloride solution by heat.

Soluble in ammonium citrate solution, 15 Cc., B. P., by heat.

Soluble in manganese citrate, 2.5 Gm., with sodium citrate, 5 Gm., in solution by heat.

Soluble in 10 Gm. manganese citrate by heat.

#### No. 2.

Egg albumen (peptonized)....	25 Gm.
Iron chloride.....	5 Gm.
Sodium hydroxide, q. s.	

Precipitate is insoluble in sodium citrate or sodium hydroxide. Soluble

in sodium citrate with ammonium chloride, sodium citrate with manganese citrate, slowly soluble, by heat, in manganese citrate. Soluble in 15 Cc. B. P. solution of ammonium citrate.

NO. 3, HARRISON'S METHOD.

Egg albumen (peptonized).....	30 Gm.
Solution of ferric chloride .....	15 Gm.
Ammonia water.....	12 Cc.
Sodium citrate.....	5 Gm.
Sodium hydroxide q. s.	

Ammonia water previously diluted with equal volume of water is added to solution of ferric chloride in divided portions and the mixture is stirred after each addition until solution is effected. Precipitate is then formed and collected in the usual way.

Precipitate is soluble in sodium citrate 5 Gm. in solution, by heat, insoluble in sodium hydroxide.

My conclusions are that the best method of producing a soluble iron-albumen compound is to make it soluble by means of sodium hydroxide. I am also inclined to think that, perhaps, ammonium citrate under proper conditions might be a suitable agent.

In regard to the iron-peptone soluble compound my observation teaches me that it may best be prepared by forming the precipitate after partially neutralizing a solution of chloride of iron with ammonia, Harrison's method, and dissolving it in sodium citrate or by dissolving in ammonium citrate the precipitate formed by neutralizing iron chloride and peptone solution, my method.

In regard to the iron and manganese compound I believe, after five years' observation, that the most satisfactory method is to dissolve the iron-peptone compound by the aid of manganese citrate, and sodium citrate. The sodium citrate acts mainly as a solvent for the manganese citrate and prevents precipitation on the addition of alcohol to the aqueous solution.

Probably equally as satisfactory is the method suggested by Harrison of adding manganese citrate to his solution of iron peptonate.

From a scientific standpoint the most interesting facts of this investigation are the following :

The iron-peptone compound formed after partially neutralizing a solution of ferric chloride with ammonia, before mixing with peptone is soluble in sodium citrate solution, while the iron-peptone compound precipitated in exactly the same manner, in the absence of ammonia is not soluble in sodium citrate unless ammonium chloride or citrate be added. This fact and other considerations led me to believe that when iron and peptone solutions are neutralized in the presence of ammonia the resultant precipitate is an ammonium compound. This would explain why the one precipitate may be dissolved directly in sodium citrate solution while the other requires the addition of an ammonium compound before it becomes soluble.



I undertook by many and various ways to prove the presence of ammonium in this compound but was unable to differentiate it from ammonia formed by the breaking-down of the protein molecule. If ammonia exists as such in the compound it is held very strongly.

I believe it would be most interesting and helpful to many of us to know something of the chemical nature, even from an empirical standpoint, of these protein compounds with metals, and this is the reason why I bring these data before the Scientific Section so that some experienced investigator may become interested in this subject.

The Chair called for discussion on "this interesting paper upon an interesting subject." He said he thought that Mr. Dunning's work would be of service to the Revision Committee of the National Formulary, as it might be that they would be glad to take cognizance of this work on preparations of this kind, that are either already in the Formulary or may be added to it.

Mr. Dunning suggested that the Committee on National Formulary, of which he happened to be a member, had already had the benefit of whatever information this work could give them, and the only point he wanted to bring out before the Scientific Section was, What is the nature of these compounds? That is the point this Section might investigate if thought sufficiently interesting. Two iron and peptone compounds were prepared according to identically the same method, except that in the one case he neutralized the iron and peptone solution with ammonia, and in the other with sodium hydroxide solution; when ammonia is present the resultant precipitate may be made soluble by sodium citrate, while the precipitate produced by neutralizing with sodium hydroxide is not soluble in sodium citrate, but is soluble in ammonium citrate. He said he was unable to detect ammonia in the compound that is precipitated in the presence of ammonia. Now the question is, Why is it that the one precipitate dissolves in sodium citrate solution and the other does not?

Mr. Puckner said that the work of Mr. Dunning was valuable in so far as it would probably displace from the market more and more these so-called solutions of peptonized iron, solutions of some salt of iron to which a peptone solution has been added. The solutions are not peptonates at all; the manufacturers know this and dare not call them so, but they use the word "peptonized" in the hope that physicians will consider them to be true peptonates. However, the iron peptonates discussed by Mr. Dunning do not belong to the class of iron compounds which physicians call "organic compounds of iron." According to pharmacologists, this peptonate of iron is not an organic compound of iron; when taken into the stomach it is quickly decomposed by the acid and the iron is present in ionic form. So far as the medicinal action is concerned, he did not think that decomposition of the peptonates of iron discussed differed in effect from citrate of iron. In some iron compounds on the market the iron is in such form that the customary reagents do not show the presence of iron, even after addition of acids.

Mr. Dunning suggested this thought for consideration : Peptone and iron may not combine chemically, but certainly peptone has a peculiar influence on iron solutions : for when mixed with a solution of iron in sufficient quantity, you can add an excess of alkali without precipitating the iron, a perfectly clear solution resulting.

If there is an insufficiency of peptone present, upon the addition of the excess of alkali, there will be precipitation. His investigations seemed to indicate, however, that there was no chemical combination, because he had been able to wash out peptone from peptone and iron precipitates, after having been previously well washed.

The Chair suggested that in this respect peptone would seem to act very much like tartaric and citric acids which prevent the precipitation of many metallic bases, and, as Mr. Puckner has pointed out, iron tartrate and citrate are not classed with the true organic iron compounds.

The Chair stated that this brought the Section up with its work to the end of the morning session—to where it should have been at the meeting hour of three o'clock—whereas now it was a quarter to five. The Chair suggested that in view of the delay in getting through with the work of the morning session, the minutes of that session, now in order to be read, might be omitted, and Mr. Asher so moved, seconded by Mr. Sayre. So ordered.

The Chair next called for further nominations for officers of the Section for the ensuing year. Mr. C. E. Caspari, seconded by Mr. Sayre, moved to close the nominations as made. Carried.

The Chair asked Mr. Sayre to preside during the election of officers. The Secretary read the names of the nominees as follows : For Chairman, Charles E. Vanderkleed, of Philadelphia ; for Secretary, A. H. Clark, of Chicago, and M. I. Wilbert, of Philadelphia.

The Chair announced that the vote would be taken for Chairman first, and said that a motion would be in order to unanimously elect Mr. Vanderkleed Chairman, in view of the fact that he had no opposition. Thereupon Mr. Francis moved that the Secretary be instructed to cast the ballot of the Section unanimously electing Mr. Vanderkleed to the office of Chairman, and this motion was seconded by Mr. Kennedy and carried. The Secretary announced that he had cast the ballot as directed.

Mr. Clark here stated that he would like most earnestly to ask permission to withdraw his name for the office of Secretary. He said that he had not been connected with the work very long, and in view of the long and faithful services rendered by Mr. Wilbert, he thought it eminently fitting that he should be selected to fill this place. He therefore moved that the Chair be authorized to cast the ballot of the Section for Mr. Wilbert as Secretary. Mr. Vanderkleed here resumed the Chair, and put the vote on Mr. Clark's motion and it carried. The Chair announced that he had cast the affirmative ballot of the Section electing Mr. Wilbert as Secretary for the ensuing year, as directed.

It was understood that the Associate on the committee should be selected by the Chairman and Secretary later.

The Chair stated that the next paper on the program was one by Mr. Sayre, upon the "Alkaloids of Gelsemium." Mr. Sayre presented his paper in abstract, the following being its full text :

#### A FURTHER STUDY OF THE ALKALOIDS OF GELSEMIUM.

L. E. SAYRE.

In 1887 Mr. F. A. Thompson made a most valuable contribution to the chemistry of gelsemium which has not, in our opinion, received the attention it deserves. Comparatively little notice is given to it in pharmaceutical literature, and almost no attempt has been made to take up the further study which the author, in this contribution, asked for.

Thompson states that he isolated two alkaloids from gelsemium root. These he obtained in solution as sulphates from which solution they were precipitated by alkali and shaken out with ether. The ethereal solution was shaken out with water acidulated with hydrochloric acid, whereby the two alkaloids were converted into hydrochlorides. The gelseminine hydrochloride (soft and colored alkaloid) being readily soluble remained in solution, whilst the gelsemine hydrochloride being much less soluble, was deposited out on standing and obtained pure by several recrystallizations from alcohol. The exact proportion of the alkaloids was not determined, but they were estimated to be approximately in relative proportion of three of gelsemine to one of the soft alkaloid gelseminine. Not having been able to obtain the gelseminine in the form of crystalline salt, the author states it may be proven to be a derivative from the first during the process of extraction, or by decomposition, or may be composed of more than one alkaloid, and suggests, as above mentioned, that it be further studied.

For the past two or three years we have been engaged in the study of gelsemium\* and have endeavored to show, in previous articles, the relation of the fresh and the dry root, have endeavored to overcome certain difficulties in the assay of the preparations owing to the presence of a persistent reddish-yellow principle interfering with color titrations, and have entered into the field which has to do with the alkaloid constituent or constituents.

It may be stated in passing that we have had some difficulty in obtaining the crystalline salt from the fresh root. So minute in quantity was the yield that we are led to the belief that the fresh root yields a very minute quantity of a crystalline alkaloid.† It is possible that fermentative changes take place to a greater or less extent during the process of drying, by which the physiological principles are modified by hydrolysis. It should

\* Since last year's report (see Proceedings A. Ph. A., 1907), we have been able to obtain small quantities of crystalline gelsemine hydrochloride from fresh root.

† See Proceedings A. Ph. A., 1905, p. 282; 1906, p. 383; 1907, pp. 352, 356.

be stated in passing that the gelseminine of the market is nothing more nor less than the colorless and crystalline gelsemine. If Thompson's gelseminine is, as he states, the tetanizing principle in the drug, and gelsemine the heart depressant, then this confusion of names of preparations on the market becomes a serious matter and should be discontinued.

During the present year over forty pounds of the drug were employed by us for alkaloidal study. This quantity was divided into three portions which may be designated as A, B and C.

A. Consisted of ten pounds subdivided into several portions for the purpose of study of methods of extraction and for observations as to the most economical method for obtaining the maximum quantity of alkaloid and a minimum waste of same.

B. Ten pounds were extracted by means of three solvents in succession, —petroleum ether, ether, and alcohol; each of these extractions were separately studied for alkaloidal content, this operation being suggested by the results obtained from A.

C. Twenty pounds were extracted and subsequently finished to the final alkaloidal residues, following strictly the method of Thompson,\* in order to separate and study, if possible, the two alkaloids, gelsemine, and the so-called gelseminine.

It should be stated as regards A, referring to economic methods, that the use of lead salts, such as subacetate or acetate of lead, in the precipitation of the so-called gelsemic acid, is decidedly wasteful inasmuch as even by most careful manipulation, it is liable to lose the larger part of alkaloidal material. Thompson uses calcium hydrate to render insoluble the organic acids, which he mixes with the powdered drug before percolating it with alcohol. This has an advantage, but it does not accomplish the desired results because it does not eliminate the gelsemic acid. Calcium gelsemate is soluble in alcohol, less soluble in chloroform, still less in water, and because of its presence, thus introduced, gives trouble when the alkaloid is sought for. It persistently contaminates the alkaloid when chloroformic solutions (chloroformic washings) are evaporated, depositing in light yellow crystals with adherent alkaloid, and therefore difficult to separate. We have found the largest yield of alkaloid by treating the drug by the three solvents successively, petroleum ether, ether and alcohol. The petroleum-ether solution contains a very minute quantity, if any, of alkaloid, a quantity of inert coloring matter, oleoresinous matter and other extraneous substances. The ethereal solution contains some alkaloid, and quite a quantity of gelsemic acid, but the major portion of the alkaloid is contained in the alcoholic solution. The alkaloid is easily removed from the ethereal solution by the common washing-out method. The alcoholic solution, however, must be treated very carefully; first, by evaporating to

---

\* Pharm. Era, 1887, p. 3.

a concentrated condition, making alkaline by ammonia ; shaking the alkaline solution with purified benzol ; washing the benzol solution with 2 per cent. sulphuric acid ; washing the acid solution with successive portions of chloroform until the gelsemic acid is removed ; neutralizing the acid solution, then, with ammonia ; washing out the alkaline solution with chloroform ether (1 part of the chloroform to 5 of ether) ; washing the chloroform-ether solution with water to remove ammonia salts and color (this operation loses some alkaloid because of the solubility of the alkaloid in ammonia, still this may be recovered) ; finally, washing the ether-chloroform solution thus purified with 2 per cent. hydrochloric acid until the alkaloid is removed and allowing the acid solution to evaporate very slowly in a current of warm air. The collected deposit (crude gelsemine hydrochloride) is purified by placing the deposit, after drying, upon a filter and washing with alcohol until colorless.

In making our deductions concerning the principal constituents of gelsemium we have to recognize the existence of two important extraneous vegetable principles, which have to be eliminated (to say nothing of the ammonium salts) before a successful separation and crystallization of the alkaloid gelsemine can be accomplished. The two principles are the so-called gelsemic acid (the esculin-like principle) and an associated reddish-yellow resinous coloring principle, which behaves to the aqueous-acid solvents and the immiscible solvents very much like that which characterizes the alkaloidal material, namely, it will be separated from an alkaline solution in certain proportions by means of the immiscible solvents and washed from the immiscible solvents by diluted acids. It will migrate from one solvent to the other very much as an alkaloid, and will cling to the alkaloid very tenaciously, or vice versa. By concentrating the hydrochloride solution of the alkaloid gelsemine, from which has been removed the maximum quantity of this coloring matter, crystallization of the gelsemine hydrochloride takes place. The crystals are contaminated with the reddish-yellow coloring matter, which can be removed from the crystals if they be placed in a filter, as above mentioned, and carefully washed with cold alcohol. The latter washings when evaporated deposit the so-called soft alkaloid gelseminine in form of hydrochloride.

The supernatant acid liquid, which represents the gelseminine chloride of Thompson, when evaporated to a solid forms a gummy semi-resinous mass of a reddish-yellow color, which gives a strong alkaloidal reaction ; but we have not yet been able to identify this substance as a new and distinct alkaloid. We have carefully studied this resinous residue corresponding to Thompson's gelseminine and have been inclined to the opinion, based solely on chemical observations, that it is the gelsemine alkaloid tenaciously combined with a certain proportion of this difficultly removable resinous coloring matter which behaves toward solvents as do alkaloids. Our argument against its being classed as a definite alkaloid is : first, it has never

been purified sufficiently to show this; its behavior toward reagents is quite similar to that of gelsemine modified by the above-stated coloring matter. It is true that some of the color reactions are quite distinct. May not the combined coloring matter, however, modify these color-reactions? For example, sulphuric acid and manganic oxides give with gelsemine a cherry-red, and with gelseminine a purple. The final color of both, however, merges into a green, fading to a yellow. Thompson did not observe this end reaction. This so-called gelseminine is yielded furthermore in larger or smaller proportion, according to the care and skill with which the coloring matter, devoid of alkaloidal property, has been removed. The greater the purification, the deeper in color the coloring matter (or colored alkaloid) becomes, and changes from a reddish-yellow to a deep garnet-red.

If it were possible to remove the coloring principle and separate it completely from the alkaloid, it would prove or disprove the above theory. We have endeavored for this purpose to study the action of the various recognized solvents, and we feel that we have been, in a measure, able to do this.

This resinous alkaloidal deposit, which we designate as Thompson's gelseminine, we have found to yield the white crystalline gelsemine by treating it with boiling toluene, mixed with a small quantity of alcohol. This uncrystalline residue (gelseminine residue) yields an additional quantity of white alkaloid, gelsemine, (very small quantity it is true) by this treatment. That is to say, we have been able to further purify the gelseminine of Thompson by the careful use of the solvents named, and have by repeated trials weakened the alkaloidal content of the same, the separated alkaloid being that of gelsemine. It is fair to assume that this neutral solvent would have not the slightest influence to change the existing alkaloidal conditions.

If we should assume that the coloring matter, separated from the alkaloid gelsemine, gives a purple color with sulphuric acid and potassium dichromate (one of the reagents Thompson uses) this would explain the reactions we have observed in the purified "gelseminine," and support the theory that gelseminine is a mixture of gelsemine and a bitter coloring matter. In proportion as the gelseminine is purified, that is, in proportion as the gelsemine is eliminated from the uncrystalline residue, the reddish color with sulphuric acid and potassium dichromate (characteristic of gelsemine) disappears, and the purple, characteristic of the assumed coloring matter, predominates until finally no reddish color makes its appearance.\* It remains still to prove whether this deep garnet-red residue is coloring matter and alkaloid persistently combined, or whether it is indeed a definite colored alkaloid. We feel that this cannot be

---

\* Thompson's gelseminine gives a reddish-purple color with this reagent.

proven by chemical means until considerably more work has been done upon it. We have been led, therefore, by our past year's chemical work, to the suggestion that the so-called uncrystalline "gelseminine chloride" of Thompson is a modification of gelsemine, consisting of a combination of the colorless alkaloid and resinous-like bitter coloring matter which it is not possible to break up by any ordinary means of alkaloidal separation.

The fact however that the amorphous mass, representing Thompson's gelseminine, in spite of our best efforts to extract the alkaloidal material from it, still contains to a marked degree, an alkaloid, leads us to another theory, that Thompson's gelseminine is a derivative of a colorless crystalline alkaloid and other constituents by hydrolysis during concentration and possibly by a polymerization, and may consequently, bear the same relation to the native alkaloid as chinodine does to quinine, or alkaloids of cinchona.

Recognizing the fact, therefore, that the chemical examination, which suggested the first theory, namely, that gelseminine was an amorphous form of gelsemine or a mixture of gelsemine and coloring matter, left the matter in a still indefinite state, we decided that further light might be thrown upon the question by submitting the products of our chemical experiments to physiological tests. We accordingly submitted our products to Dr. E. D. Reed, Pharmacologist of the H. K. Mulford Company, through whose kindness a pharmacologic examination was made. Dr. Reed personally examined the products and submits the following statements:

“ PHYSIOLOGICAL TESTS ON GELSEMINE CHLORIDE NOS. 1 AND 2  
AND GELSEMININE CHLORIDE.

These substances were tested for the purpose of determining what, if any, physiological difference existed between them.

*First. Their action on the frog.*

A series of frogs were injected with doses of each of the substances of from ten to twenty mgs. A dose of 10 mgs. of gelsemine chloride Nos. 1 and 2 caused after from 30 minutes to 1 hour a loss of voluntary movement, but was not fatal after 48 hours. The same effect was noted with 10 mgs. of gelseminine chloride and the lethal dose of the latter for frogs lies near 15 mgs. The action on the frog's heart was the same for each of the substances, namely, a slowing and irregularity of action sometime after the administration of the drug.

*Second. The lethal dose on guinea pigs.*

The lethal dose on guinea pigs was determined by subcutaneous injection of a 1:500 solution of each of the alkaloids. 10 mgs. of gelsemine chloride Nos. 1 and 2 was without appreciable effect after 5 hours. On the other hand gelseminine chloride was fatal in doses of 1 mg. within 40 minutes. The toxic action developed rapidly and was marked by paralysis of voluntary movements and later by a tetanizing effect similar but not nearly so marked as that following the administration of strychnine. The pig dies in convulsion. The lethal dose lies between 0.25 mg. and 0.5 mg. 0.1 mg. was without effect and the pig was alive at the end of 48 hours. A diuretic action of gelseminine hydrochloride was noted in some instances, but did not appear to be a constant feature of the drug.

Postmortem examination of guinea pigs dead from gelseminine-hydrochloride poisoning gave no information regarding its action. The heart in each case was in diastole. Blood pressure tests were not made.

*Conclusions:* Gelsemine chloride and gelseminine chloride have a common action on the frog, namely, an interference of voluntary movement. This action, however, is more pronounced with gelseminine chloride than with gelsemine chloride. On the guinea pig, gelsemine chloride is not effective in twenty times the dose of gelseminine chloride. Gelsemine chloride administered in ten times the dose of that of gelseminine chloride which produced marked symptoms and death, was without appreciable effect.

Physiologically, therefore, gelseminine chloride differs from gelsemine chloride, and it seems not improbable that the similar action observed on the frog between gelsemine chloride and gelseminine chloride is due to traces of the latter substance being present in the substance known as gelsemine."

Dr. Reed's results, therefore, not only point to the presence in Thompson's "gelseminine" of a highly active and toxic alkaloid, markedly stronger in its action than purified gelsemine, but suggest the possibility that gelsemine itself owes what activity it may possess to the presence of traces of the difficultly separated "gelseminine." On the other hand, we have clearly demonstrated by chemical means that Thompson's so-called gelseminine is in part at least a mixture of gelsemine and coloring matter. It would seem, therefore, that we have here a very interesting problem, and one worthy of the best efforts of pharmacologists and chemists to solve.

#### *Assay of Preparations of Gelsemium.*

At the last annual meeting of this association I reported two methods for the assay of preparations of gelsemium and promised to follow up this investigation during the present year. I have found that Professor Havenhill's gravimetric process gives results which are entirely too high on account of adherent coloring matter, but I have found that the Webster general process for alkaloids which is given in the American Journal of Pharmacy for July, 1907, and applied by me (see Proceedings Amer. Pharm. Ass'n, 1907, p. 356) is decidedly the most favorable process for alkaloidal gelsemium estimation. Care has to be used in shaking out the alkaloid that no emulsion occurs. This can be obviated by avoiding vigorous shaking during the process. The great advantage of the Webster process is that the final solution for titration is apparently free from coloring matter. It has only a slight fluorescence and makes an ideal solution for titration. In making five tests for alkaloidal strength, in a well-known preparation on the market, we obtained the following results:

Amount Fluidextract.	Alkaloid.	Percent Alkaloid.
10 Cc.	.03479	.3479
10 Cc.	.03304	.3304
10 Cc.	.03335	.3335
10 Cc.	.03504	.3504
10 Cc.	.0354	.3543



Mr. Webster has sent the following results of two samples of fluidextracts which he examined by the same process :

Solids in 100 Cc.	Alcoholic Strength.	Alkaloid (Lyons' equivalent for 1 Cc.
		$\frac{1}{2}$ acid is 0.408 of alkaloid).
Sample I. .... 11.3 Gm.	84 per cent.	{ (a) 0.482 per cent. (b) 0.478 per cent. 0.405 per cent.
Sample II. .... 4.0 Gm.	72 per cent.	

As an indicator Mr. Webster prefers a solution of iodeosin in water saturated with ether, the neutral point being determined by noting the color of the mixture on agitating. Our own results were obtained by using cochineal as indicator.

In conclusion we wish to state that in addition to the much-appreciated work of Dr. Reed and Mr. Webster above referred to, we are also under obligation to Messrs. Parke, Davis & Co. and Prof. J. U. Lloyd for authentic material, and to Mr. H. W. Emerson and Mr. Adolph Ziefle for valuable laboratory assistance.

In connection with his paper, Mr. Sayre exhibited some samples of gelsemine, gelseminine and gelsemic acid, for inspection by the members.

The Chair called for discussion on Mr. Sayre's paper.

Mr. Francis said that it had happened by a mere accident he was present at the time Mr. Thompson did this work some time ago, and he was impressed then, as now, with the extreme difficulty encountered by one who attempts to separate the alkaloids of gelsemium. As he recalled Mr. Thompson's work, he relied almost altogether on the gelsemine as the principal alkaloid. He did not think his experiments were carried to any such degree as those of the present writer. His results were undoubtedly satisfactory, and their value, as Mr. Sayre says,—while undoubtedly of value because they give us some light on this matter,—might serve as the basis for further procedure. Mr. Sayre has carried this investigation further than Mr. Thompson, particularly in comparing physiologic activity, something Mr. Thompson was not so well able to do at that time for the lack of facilities. A very peculiar thing was evidenced here in that the crystalline principle appears to be the weaker of the two, and at the same time the conclusion seems to be that this resin-like gelseminine is very much more active than the crystalline substance that Mr. Sayre denominates gelsemine. He says that the active gelsemine may be due to the presence of very minute portions of the difficultly separated gelsemine.

Mr. Francis said he could not exactly draw the same conclusions as the result of these tests. This matter, however, is worthy of some further investigation, as he did not think the true value of gelsemium as a therapeutic agent was fully appreciated. There are, however, a number of physicians,

particularly in the Southern States, where this plant is indigenous, who rely upon it largely, and it is used in considerable quantities. On the other hand, there are other physicians in the United States that, for all practical purposes, never heard of it at all.

He said Mr. Sayre referred to the confusion likely to arise. He was right about that, because gelseminine and gelsemine are alkaloids. The first means nothing to the average pharmacist, and if it was possible to clear up this confusion as regards these two things it was highly desirable to do so.

The Chair stated that Mr. Francis had touched upon a most important feature brought out in this paper, viz.: That the gelseminine seems to be more active than what we have always considered to be the active principle, the crystalline alkaloid; and this led him to believe that it would be necessary, first, to take up the assay process for gelsemium whereby the total alkaloid is determined, and compare the results with the therapeutic effect produced by the drug or preparation from which the total alkaloid was extracted in the assay, in order to see whether the assay figure is the real measure of therapeutic activity. If it is found that gelsemine is much less active than gelseminine, but that it exists in much larger amounts than the latter, which he believed Mr. Sayre found to be true, then—

Mr. Sayre here interrupted to say that it depended entirely upon the condition of the drug. He was surprised to see the great variation in that respect. He said last year the green root did not contain any of the crystalline alkaloids, and comparatively little this year. He could get a very small percentage in the green root, but the dry root varied very much in that respect.

The Chair stated that this made all the stronger what he was about to say, that whereas the ordinary assay process determines the total alkaloid, the variable proportions of less active gelsemine and more active gelseminine might cause the result of the assay process to indicate entirely different things with different drugs and different preparations, so far as the therapeutic activity was concerned. He would state that in his laboratory they had already started investigations of that kind, comparing the results obtained by this process of assay recommended by Mr. Sayre with the lethal dose on guinea-pigs of the preparation from which the alkaloids were obtained, and he hoped when they had made a sufficient number of these tests some light would be thrown upon the question.

The Chair called for further discussion upon the paper, but none was offered, and he said the paper would take the usual course, without objection. So ordered.

The Chair stated that the next paper on the program was by an author who was not present, but who, for special reasons at this time, deserved some attention, and he asked Mr. Wilbert to present a brief abstract of the paper by Mr. Enno Sander, of St. Louis, on the subject of the "Superiority

of Artificial Mineral Waters," simply stating the scope of the paper, which he said would take but a minute or two. Mr. Wilbert presented the paper in abstract, the full text being as follows :

#### THE SUPERIORITY OF ARTIFICIAL MINERAL WATERS.

BY ENNO SANDER, PH. D.

Although mineral waters apparently come from the depth of the earth their origin is really formed in the clouds where the watery vapor is mixed with and absorbs the different gases of the atmosphere, mainly carbon dioxide, hydrogen and nitrogen, and then condensed to its liquid form, descends to the surface of the ground which it endeavors to penetrate in various ways.

The elements of nature are in constant activity against each other and a product has been scarcely formed when it is attacked by some other forces and doomed to change or decay. The water thrown upon the surface enters the alluvial soil which covers the top of the ground and by its gravity penetrates the different strata until stopped by an impervious layer. But it enters not only the easily accessible alluvial soil, there is nothing that is safe against its intrusion.

In his "Geological Observations" Charles Darvin (1) mentions that even gneiss and talcose slate have become disintegrated in Brazil and the other South American countries as low down as one hundred feet and R. Pumpelli in "Secular Rock Disintegration" (2) confirms it thus : "Where considerable portions of continents have remained above water during long geological periods and where the region thus exposed enjoyed a peripheral climate with a protecting vegetation and abundant generation of carbon dioxide the feldspathic rocks have been profoundly affected, granite and gneiss being decomposed, often to the depths of several hundred feet. In regions underlaid by impure limestone of great thickness, a long-continued existence as dry land results in the removal of the limestone and the formation of a residuary accumulation of the insoluble impurities."

Water by itself has a great affinity for all other substances. We have seen before that as vapor it absorbs the gases of the atmosphere and condensed it forms *meteoric* water, which precipitates upon the surface, penetrates the soil and further practices its powerful affinities upon all substances it meets in its peregrinations of the interior. It permeates the different strata in its descent, absorbs whatever will submit to its affinity until it meets the impervious layer, by which it is compelled to seek an outlet somewhere. If it comes to the surface again it is called "a spring" and exhibits by the content of its solid ingredients how long its passage through the interior may have lasted and what strata it has been visiting.

When such spring water contained medicinal substance and showed beneficial effect upon the human system it was called a "healing spring"

by the populace and its origin more or less contributed to the benign influence of an omnipresent providence. Science, however, obtained the different ingredients of the waters by analysis, and more than a hundred years ago Dr. F. A. Struve, of Dresden, demonstrated by thorough scientific research and carefully conducted experiments that mineral waters obtain their solid ingredients from the strata which they permeate with the aid of carbon dioxide, increased pressure and sometimes elevated temperature. He treated, for instance, the powdered clinkstone of Bilin a very popular spring, with carbonated water in a specially constructed apparatus which permitted the exclusion of air and increased pressure of gas and produced a water of the same mineral composition as the natural Bilin spring with only a greater amount of carbon dioxide. His experiments with other mineral strata from which springs issued met with similar results and thus by these most interesting scientific investigations he established entirely new theories of the origin of mineral springs.

These discoveries opened a new field to the operations of the ever watchful chemist and by careful examinations of the records, some strange occurrences became known in the irregularities of the flow of springs and further comparison of the analyses of waters made at different times proved irrefutably that the uniformity of the composition of spring water at all times did not exist. Not only the total of its ingredients occasionally underwent serious changes, but substances usually occurring in small quantities only, disappeared entirely in some years. Such occurrences had been pointed out by Berzelius in his analysis of the various layers of tufa at the Carlsbad Sprudel, which being a thermal spring has proved constantly its easy decomposition by covering the inside of the patient's beaker with a flimsy coat of iron and lime while he was drinking. Analysis made at intervals showed also a difference in the proportions of the ingredients; Marienbader Kreuzbrunnen left a solid residue of 69 grs. in 16 oz. in 1824, but only 49 grs. in 1829, while the Ferdinandsbrunnen had increased its solid ingredients from 1825 to 1837 by 58 grs. to the 16 oz. of water. But the inconsistency of the spring was proved implicitly by the discovery that the gain or loss of solid ingredients were not equally and proportionately affected in different seasons. Berzelius found no iodine in the Kreuzbrunnen at Marienbad in 1824, while Bauer identified it in 1835 without being able to find it again in 1836. Bauer, Berzelius and Struve found lithium in all their analyses of Carlsbad waters except in 1835 when the otherwise constant hydrofluoric acid was missing.

Similar differences have been found in the analyses of American Springs when conducted in different years. Prof. Chandler's analysis of the Congress Spring at Saratoga in 1871 agreed in its essential points with that of Dr. J. H. Steel in 1832, but the chemist of the U. S. Bureau of Chemistry found only 10.232.72 parts in one million against 15.333.9 of the former. The Vichy at the same location according to the same authority contained

1629 parts last year while a former analysis claimed 6305.9 in a million. Instead of detailing any farther the differences in these Saratoga Springs it is considered more essential for the purpose of these lines to quote the opinion of W. D. Bigelow, the Acting Chief of the Bureau of Chemistry (3) above referred to. On p. 98 he says: "Another point well worthy of note is the fact that practically all of these springs have a much smaller mineral content than they had about thirty-five years ago, when Prof. C. F. Chandler made an examination of most of the springs then in existence. By comparing the results here reported with those obtained by Prof. Chandler it will be noted that nearly all of the springs now contain only from one half to one fifth as much mineral matter as they did in about 1871." Then the summary of his study of the Saratoga water is given on p. 99:

"1. The waters are in nearly all cases markedly weaker in mineral content than they were about twenty-five years ago. 2. There is a great variation in the total mineral content of individual springs from time to time. 3. The rarer elements, such as lithium and bromine, seem to vary to a greater extent than the other elements present.

The Saxon Spring in Canton Valais, Switzerland, contained no iodine in 1884. Dr. Pigant found a considerable quantity of it in 1852; later it was discovered by M. Ter-Morin that its content had assumed a daily variation from 0-2.25 parts in 10000 parts of water.

By an earthquake the fresh water well of Castel Alfieri in Piedmont was charged with sulphurous vapors and salines in 1765, but was restored to its former freshness by another earthquake in 1808.

The thermal springs issuing from the clinkstone at Toeplitz, Bohemia, became turbid on the day of the earthquake at Lisbon, and remained so several hours; then they stopped entirely for several minutes, but reappeared and suddenly poured forth a large quantity of dirty, reddish water. They ultimately resumed their usual appearance, but are still evincing from time to time the pernicious internal influence which controls their movements in occasional decrease and subsequent advance of their flow, and keeps the anxiety of the city government in constant turmoil for fear of losing the considerable income from the therapeutical use of the springs.

These scientific researches, carried on in concert by competent chemists, led to other investigations and results, which further shattered the idea of the immaculate conception of mineral waters as taught in former years by some interested persons.

It was but natural that the qualities and behavior of the waters should be judged by the qualities of their several ingredients. The residue from the springs, the tufa formed by the evaporation of the waters, was found to be composed of the same ingredients as the solid substances contained in the water, but in different combinations. The very sensitive, soluble metallic protoxides of iron and manganese, for instance, had eagerly combined with the oxygen of the atmosphere and changed into the insoluble

oxides, while the earthy bicarbonates, liberated from interior pressure, would diffuse their loosely combined second equivalent of carbon dioxide into the air and deposit the insoluble monocarbonate on the ground.

Quite a beautiful illustration of this fact can be observed at a chalybeate, calcic spring near Warrensburg, Mo. The palatable water of the Pertle Springs issues crystal-clear from its encasement into a trough two feet below, where it leaves in a number of grooves the red precipitate of the hydrated oxide of iron formed almost immediately after its appearance on the surface. A small partition allows the water to diffuse the second equivalent of its bicarbonate of lime and deposit the insoluble salt of calcium in the extension of the trough.

This may suffice to prove the irregularities in the composition of mineral waters. In regard to the destructive influence of the atmosphere upon this composition it is only necessary to look at the rosy colored beds of ferruginous springs and the mountains of tufa surrounding all our more or less copious hot springs, proving what an enormous quantity of material they have leached from the interior of the earth during the centuries they have been traversing its bowels.

It is obvious therefore in order to obtain the full beneficial effect from the use of mineral waters, they should be taken from the springs if possible just when the water issues up from the ground, otherwise more or less decomposition may occur according to the observations that have been placed before you in the foregoing.

Only waters that are entirely free of metallic proto-carbonates and earthy bicarbonates, or such as are composed of alkaline salts only, are immune from the deteriorating action of the air. Others must be manipulated like the Apollinaris, whose original proprietor consulted Prof. Bischof of Bonn, how to avoid the residue in the jugs and was advised to expose the water in tanks to the action of the atmosphere, draw off the clear liquor, add a pinch of salt to improve the flat taste, recharge with gas and bottle it. Such was the origin of the renowned "Natural" Apollinaris, which Dr. Mohr of Coblenz called "the artificial butter among the natural mineral waters."

During the many years of my connection with the mineral-water business I have frequently received offers of agencies for the distribution of natural waters which were usually accompanied by the most florid description of their qualities. I called for the analysis, when none accompanied the offer. From its appearance I mostly declined the agency, stating why the water would not bear transportation, and if nevertheless the owner would insist upon my acceptance and send a sample, I had it settled, syphoned off the clear liquid and returned the muddy sediment as proof of my correct diagnosis.

Thus I have never succeeded in obtaining the agency of a good and substantial healthful mineral water except I manufactured it myself.

George E. Walton M. D., a most enthusiastic admirer of natural mineral waters as evidenced in his excellent book on natural waters, (5) and almost as great an antagonist of artificial waters, was compelled to acknowledge the following: "But many diseases do not admit of delay, and for this purpose the bottled waters are applicable. However, there is not the care used in bottling waters that should be observed. There are but few waters that are at all adapted to shipment; the gases escape, and some of the chemical ingredients are decomposed," and yet either his knowledge of chemistry was insufficient or his partiality too intense to let him acknowledge the superiority of Dr. F. A. Struve's attainments, who in the early part of the last century, after he had exhausted the studies of the mineral springs and all their various peculiarities, invented suitable apparatus in which he produced mineral waters absolutely equal in aspect and action to their originals. "Prompted partly by scientific interests and partly by the desire to offer to sufferers, who live long distances from mineral springs, an opportunity of enjoying their beneficial action, efforts were made to reproduce these waters by artificial process and in the course of time this end has been attained with such perfection as to permit the artificial product of to-day to place itself alongside of and compete in every respect with the natural mineral waters." (6) Dr. Struve had produced mineral waters in such perfection that the most prominent contemporary chemists like Berzelius, Faraday, Orfila, Soubeiran and others cheerfully testified as to their identity with the natural waters not only in taste and effect, but also in every physiological particular. (7) It should not be understood, however, that Dr. Struve manufactured the waters from the powdered rocks of the strata from which the springs had escaped; complete and accurate analyses had established the exact composition of their solid ingredients and he prepared the chemicals according to their peculiar virtues. Soluble substances would be introduced as such, but insoluble ones, as for instance the earthy carbonates, had to be obtained by the introduction of some soluble equivalents which would produce the desired ingredients by double decomposition. Calcium carbonate is a constituent of most waters, it will by itself never dissolve even under high pressure of carbon dioxide, but it can easily be procured by its equivalent of calcium chloride, which with the assistance of an equivalent of sodium bicarbonate forms the requisite amount of calcium bicarbonate while the excess of sodium chloride produced in the transaction has to be deducted from the original formula. This process being thoroughly rational and scientific has been adhered to ever since by the manufacturers of mineral waters. It has been adopted in the "*Adjumenta Varia*" by Dr. H. Hager and subsequently by all publishers of mineral-water guides.

The most sensitive waters were successfully prepared by Dr. Struve; they were carefully drawn into bottles, which were previously filled with carbon dioxide to expel every particle of air and they kept perfect for years without the slightest change in their appearance.

Supported in his exertions by the principal scientists of all European countries, he established factories of artificial mineral water in the principal cities from St. Petersburg, in Russia, to the celebrated watering-place, Brighton, in England, where all kinds of medicinal waters were dispensed to the satisfaction of the visitors.

Dr. August Vetter (8) has recorded the success of these establishments: "as early as 1821 patients drank *artificial* Mühlbrunnen and Neubrunnen at Struve's garden in Dresden, with the same result as others had obtained from natural springs at Carlsbad, and in 1833 an invalid came to Berlin, drank *artificial* Carlsbad Sprudel water during two seasons, and after having completed the second season left the city a perfectly healthy man."

The "Brunnenliste" (Spring Directory) of Dr. Struve and Soltman's Kurgarten of Berlin, contained in 1827 the signatures of 500 persons, of whom, according to the record, about one-half drank Carlsbad water *artificially* prepared by the well-known manufacturers.

One of the guests was the widely known Alexander von Humboldt, who inscribed his name on June 14, and thus endorsed by personal acknowledgment the scientific validity of the artificial waters.

Although Struve received the unanimous support of the principal scholars and leaders in science for his remarkable discoveries and inventions, he had many hard battles to fight with persons who cared less for science or the comfort and welfare of the unfortunates than for their own material interests. Especially the owners of springs or their managers, and especially the physicians at the watering-places tried their best to belittle the late revelations without being able to contrive any effective or telling arguments, and without the slightest influence upon the independent thinkers. Enlightened and intelligent persons endeavored to show their recognition of the value of manufactured healing waters by using them whenever an opportunity offered. "Therefore, we must acknowledge that art has not only reached the products of nature in perfection, but it has surpassed them; for she gives an intrinsically better product than nature ever can offer." (8) It is a matter of course that only the employment of pure materials can produce perfect goods and only by strict adherence to this principle pure artificial mineral waters can obtain and maintain their just reputation.

The first requisite is pure water composed of hydrogen and oxygen only. Such water can only be obtained by distillation, and in order to procure it in perfect order, great care must be observed in its preparation.

Many different plans have been proposed for the accomplishment of this purpose too numerous to mention or to criticise. I may be permitted, however, to explain my process which is being employed in the factory of the Enno Sander Mineral Water Company. Their apparatus is of my own construction and has been fully described in "The Pacific Pharmacist" to which I refer for brevity's sake and relate here only the most essential parts.



The water of the artesian well is utilized for cooling and condensing the vapor in the still and advantage taken of its high temperature, when it reaches the top and discharges itself to free it as much as possible of its solids by thoroughly boiling it with appropriate chemicals. The precipitate being settled, the decanted liquor is boiled for an hour or longer in an open vessel with as much solution of potassium permanganate as may be required to have it retain a roseate hue. The water thus treated has become liberated from almost all its solids, and of all gases and organic matter, and is permitted now to enter automatically the still where it undergoes the usual process with one exception which refers to its aeration.

Advocating the theory that water is too hard and compact a substance to be aerated even if broken up into very small globules, I imitate nature's process in the clouds and have introduced a contrivance at the top of the still by which the vapor is intimately mixed with pure sterilized air. After cooling it runs into the reservoir a cool, perfectly aerated, palatable water. Such a product of distillation can safely be used for the manufacture of mineral waters except for chalybeates which demand the expulsion of the air.

Dr. F. A. Struve was the successful pioneer in creating the demand for pure, unadulterated and unchangeable mineral waters away from the natural springs. Perhaps it would be a popular move if the large number of his followers in this country would recognize his distinguished merits for suffering mankind by a grand centennial celebration. It could not hurt the present generation. Quite to the contrary, for late experiences have proved that in spite of the increase in the manufacture of waters during the past century the following passage written fifty-five years ago, may conscientiously be applied to frequent occurrences at the present time (10): "And if a not inconsiderable number of patients drinks the natural bottled waters and physicians still prescribe them in the conviction to have the unaltered natural product and its complete equivalent the acute observer has abandoned this opinion a long time ago."

The arguments and statements embraced in the foregoing lines attest implicitly the various changes which must occur to water during its penetration of the earth's interior as well as the danger unavoidably met with at its appearance on the surface. The effect shown there simply excludes its employment anywhere else but at the place of egress.

The fact also has been firmly established that mineral waters should be manufactured from pure distilled water and pure chemicals in an apparatus carefully constructed to fully correspond to its purposes and to exclude absolutely the perilous action of nature which is always ready for mischief. It was Dr. Struve and his numerous German followers to whom everlasting credit is due for their great scientific activity, which enables us to obtain in true scientific manner absolutely superior mineral waters that are guarded by art against deterioration and loss or change of their ingredients and may be administered conscientiously with full therapeutical benefit to poor sufferers at any place where they may be needed.

The writer will be richly compensated for his labors, if he has attracted the attention of the intellectual members of the American Pharmaceutical Association to this important subject and convinced them of the *superiority* of the *artificial mineral waters*.

## BIBLIOGRAPHY.

1. Charles Darwin, Geological Observations, p. 427.
2. R. Pumpelli, Secular Rock Disintegration, Amer. Journ. Science and Art.
3. Mineral Waters of the United States, Bureau of Chemistry, Washington, D. C., 1907.
4. Zeitschrift für Mineralwasser-fabrikation, P. Lohmann, Berlin, 1886, Nos. 9 and 10.
5. Geo. E. Walton, M. D., The Mineral Springs of the U. S. and Can., 1883, p. 213.
6. Chemical Dictionary, Justus von Liebig, 1851, Vol. 5, p. 320.
7. Dictionaire de Medicine, Tom. 2, p. 70.
8. Allgemeines Badebuch, Dr. A. Vetter, Berlin, 1840.
9. Annalen der Struveschen Brunnenanstalten, Dr. A. Vetter, Berlin, 1842.
10. Dr. Struve, Mineralwasser-Anstalten, 853, pp. 6 and 8.
11. The Pacific Pharmacist, Vol. 1, No. 8, p. 395.

Mr. Wilbert explained that Mr. Sander, the writer of the paper, this year celebrated his semi-centennial as a member of this association. He had met him in St. Louis on Wednesday evening last, and, for his years (87), he seemed to be a very vigorous and active man. For quite a number of years, he said, Mr. Sander had been a manufacturer of mineral waters, and whilst his opinions differed from those usually held they were deserving of careful consideration.

The Chair said that this paper, with the consent of the Section, would be received to take the usual course. So ordered.

The Chair called attention to several papers printed in advance of the meeting, which would be read by title only, as the authors were not present. He asked the Secretary to place copies on the table, so that the members could get them and take them home with them. These papers were as follows:

One on "The Detection of Phenol and Creosotic Acids and its Derivative," by H. Engelhardt and H. W. Jones. Another on "Syrup of Hypophosphites and Syrup of Calcium Lactophosphate," by H. W. Jones. Another on "Volumetric Methods for the Estimation of Phosphoric Acid," by Virgil Coblentz and Otto B. May. Another on the "Deterioration of Hydrocyanic Acid," by Mr. Coblentz and Mr. May, and another on "Arsenic in Bismuth Salts," by the same authors. Still another on "Acetic Acid Fluidextracts," by Joseph Feil, of Cleveland. The full text of said papers here follows, in the order given:

THE DETECTION OF PHENOL AND CRESOTIC ACIDS IN SALICYLIC ACID AND ITS DERIVATIVES.

BY H. ENGELHARDT AND H. W. JONES.

In a previous note (D. A. Ap. Ztg., 1908, No. 12) we pointed out that the reaction for phenol, as given by Carletti (Boll. Chim. Farm., 1907,

No. 11), is sensitive to 0.1 per cent. of phenol in salicylic acid, and not to 0.02 per cent. as claimed by the author. At the same time we applied this test, with the necessary modifications, to various salicylates and to natural and synthetic oils of wintergreen. The test, as described by the author, is carried out as follows: 0.25 Gm. of salicylic acid are triturated in a mortar with 5 Cc. of water. The mixture is transferred to a test tube, two drops of a 2 per cent. alcoholic solution of furfural are added, followed by 2 or 3 Cc. of concentrated sulphuric acid poured carefully down the side of the tube. If phenol is present, a yellow zone forms at the junction of the two fluids, which zone turns shortly to blue.

By different authorities it is claimed that not alone phenol, but more especially those by-products, such as cresotic acids, which are formed in the process of manufacture of salicylic acid, produce the injurious by- and after-effects occasionally noticed. It was, therefore, a matter of interest to determine whether or not the cresotic acids are subject to the Carletti reaction, and whether the sensitiveness of the reaction, when applied to these acids, is of a similar degree to that obtained with phenol.

We procured samples of ortho-, meta- and para-cresotic acids, and by their melting-points, etc., established them as pure substances free from any admixture. These acids were mixed in the proper proportions, with a salicylic acid and a sodium salicylate which previously had been proven to be free from phenol, and it was found that as little as a 0.05 per cent. addition of these substances to salicylates may be detected by the Carletti reaction.

The tests were carried out as follows: An alcoholic solution of the cresotic acid was prepared containing 0.05 Gm. of acid per 100 Cc. Four portions of 0.25 Gm. each of pure salicylic acid, previously determined to be free from phenol, were mixed respectively with 1 Cc., 0.75 Cc., 0.5 Cc. and 0.25 Cc. of the above solution in porcelain bowls and evaporated to dryness. The residues were triturated with 5 Cc. of water and the mixtures transferred to test-tubes without filtering. After the addition of two drops of a 2 per cent. alcoholic solution of furfural, the mixture was underlaid with 3 Cc. of concentrated sulphuric acid. The colors developed at the zone of contact of the two fluids were observed as follows:

*Ortho cresotic acid*—1. Cc. (0.2 per cent.)—Brown zone.

0.75 Cc. (0.15 per cent.)—Faint brown zone.

0.50 Cc. (0.1 per cent.)—No color.

0.25 Cc. (0.05 per cent.)—No color.

Note—When, however, the o-cresotic acid is converted into its potassium salt, as in the process described below, the color reaction appears very clearly, due apparently to the higher solubility of o-cresotic acid in statu nascendi.

*Meta-cresotic acid*—In each case a red-violet zone was produced very similar to that obtained with phenol.

*Para-cresotic acid*—Results similar to those obtained with *m*-acid.

In the case of sodium salicylate the test was performed in the following manner: A solution of the potassium salt of cresotic acid was prepared by neutralizing 0.05 Gm. of the acid with KOH solution and making the volume up to 100 Cc. with water. To five portions of 0.5 Gm. each of pure sodium salicylate were added respectively 0.25 Cc., 0.5 Cc., 1.0 Cc., 2.5 Cc. and 5 Cc. of this solution. Dilute sulphuric acid was then added to a decided acid reaction and the volume in each case made up to 10 Cc. After thorough shaking, 5 Cc. of the liquid was filtered off and tested as for phenol by the addition of two drops of furfurol solution and 3 Cc. of concentrated sulphuric acid. In all cases with each of the three cresotic acids, the color obtained was identical with that obtained in the presence of phenol, the reaction being sensitive to as low as 0.05 per cent. of cresotic acid. Although the cresotic acids are very difficultly soluble in water, sufficient substance, after acidulating, seems to remain in solution to give the reaction. It is evident, therefore, that the Carletti reaction is as useful for the detection of cresotic acids in salicylic acid and salicylates as it is for the detection of phenol in these substances.

We never were able, in all our tests for phenol, when a positive reaction was observed, to obtain the blue color observed by Carletti. The coloration, though distinct, is a faint violet only. Of the salicylic acids and derivatives which have passed through this laboratory for examination, about eighty were subjected to the Carletti test, with the following results:

	No. of samples containing phenol.	No. of samples free from phenol
Salicylic acid—synthetic.....	2	10
Salicylic acid—natural .....	none.	2
Sodium salicylate—synthetic.....	4	10
Sodium salicylate—natural.....	2	3
Strontium salicylate—synthetic .....	4	4
Ammonium salicylate—synthetic.....	5	2
Physostigmine salicylate—synthetic .....	none.	1
Lithium salicylate—synthetic.....	3	6
Cinchonidine salicylate—synthetic .....	1	1
Oil of wintergreen—synthetic .....	4	11
Oil of wintergreen—natural.....	3	1

It is interesting to note that, of the four samples of natural oil of wintergreen examined, three gave the test for phenol, the reaction being clear and distinct in each case. The reason for this we are at present unable to state; it may possibly be due to phenol-like bodies contained in the oil. Nothing touching this point has been found by us in the current literature, but no doubt some light may be obtained on the subject in the future.

The test of the Pharmacopœia for phenol in salicylic acid is rather lenient and might perhaps allow products containing traces of injurious sub-

stances, to escape. Among the salts and esters no tests for phenol or phenol-salts are given. Undoubtedly it is difficult to say whether or not these small amounts of phenolic by-products really produce the injurious effects ascribed to them, but it is interesting to note that of the eighty samples examined only 60 per cent. are free from contamination with these substances.

#### NOTES ON SYRUP OF HYPOPHOSPHITES AND SYRUP OF CALCIUM LACTOPHOSPHATE.

BY H. W. JONES.

It is a well-known fact that many of the official syrups, such, for example, as syrup of hypophosphites and syrup of calcium lactophosphate, lose, in the course of time, their original sweet taste to some extent, and gradually assume a thicker consistency. As has been shown by several investigators, this is due to a gradual conversion of the cane sugar present, the conversion being caused either by free acids or by salts of the heavy metals in solution in the syrup.

In an article on the subject (*Am. Jour. Pharm.*, 70, p. 585), Haussmann gives the results of investigations upon several of the official syrups, as syrup of hydriodic acid, syrup of hypophosphites, syrup of calcium lactophosphate, and a number of others, which investigations bring out plainly the progressive inversion taking place in these syrups, and its effect upon some of their physical properties, such as color and taste.

Woltersdorf and Richtmann (*Pharm. Archives*, Vol. 3, Nos. 5 and 6) have covered the ground very fully, extending their researches to a number of the official elixirs as well as to the greater portion of the official syrups. They have recorded the progressive inversion taking place in these preparations at three different temperatures; viz., room temperature averaging 18° C., refrigerator temperature averaging 10.2° C., and thermostat temperature averaging 36.2° C.

During the ordinary course of investigation in this laboratory in the past year, a number of samples of syrup of hypophosphites and syrup of calcium lactophosphate came under examination, many of which, by their abnormal physical properties as well as by qualitative chemical tests, showed the results of inversion. At that time the work of the above-mentioned investigators had not come to my notice, and, wishing to obtain some light as to the extent and rate of the inversion taking place in these syrups, the following described investigations were undertaken:

Freshly-prepared syrups were used in order to observe the progressive inversion taking place, as well as any physical changes resulting from this inversion. The syrups were prepared as follows, in quantities of 500 Cc.:

No. 1. Syrup hypophosphites U. S. P. The formulæ of the official syrups are familiar, or easily referred to, and need not be given here.

No. 2. A special syrup hypophosphites prepared according to the following formula:

Calcium hypophosphite.....	16.0 Gm.
Potassium hypophosphite.....	7.0 Gm.
Sodium hypophosphite .....	11.0 Gm.
Hypophosphorus acid (50 per cent.).....	1.5 Cc.
Sugar .....	335.0 Gm.
Water .....	q. s., ad. 500.0 Cc.

No. 3. Syrup hypophosphites U. S. P. without the addition of dil. hypophosphorous acid.

No. 4. Syrup calcium lactophosphate U. S. P.

No. 5. A special syrup calcium lactophosphate prepared according to the following formula :

Calcium phosphate, precipitated .....	15. Gm.
Phosphoric acid.....	3.9 Cc.
Hydrochloric acid .....	12.5 Cc.
Lactic acid .....	3.9 Cc.
Sugar.....	390.0 Gm.
Water .....	q. s., ad. 500.0 Cc.

It is well known that organic acids have not so great a power of converting cane sugar into glucose as have the inorganic acids.

To determine the effect of organic acids in such combinations as these syrups, two syrups were prepared after formula No. 2, the hypophosphorous acid in one case being substituted by 3 Gm. of citric acid and in the other case by 3 Cc. of lactic acid. We, therefore, add to the list :

No. 6. Syrup hypophosphites with citric acid.

No. 7. Syrup hypophosphites with lactic acid.

These syrups were kept in well-stoppered pint bottles in a dark place, and subject to the changes of room temperature which might vary from 15° C. to 30° C. according to the season or time of day. Once in a fortnight each syrup was examined as follows :

1st. A measured portion was removed from its container, and after proper dilution to a definite volume, was titrated against a standardized Fehling's solution, the completion of reduction being determined by placing a drop of the liquid upon the upper of three layers of filter paper and adding to the spot on the lower layer a drop of potassium ferrocyanide solution acidulated with acetic acid. An absence of red coloration indicates the completion of the reduction. The method of Harrison and Kelly (Ph. J., 1903, 170)\* for determining the completion of reduction was also tried in this connection, and, while giving excellent results, was

---

\* This method is as follows: A solution of 0.05 Gm. of starch and 10 Gm. of potassium iodide in 90 Cc. of water is prepared, 0.5 Cc. to 1 Cc. is mixed with 5-10 drops of acetic acid and a drop of the titrated liquid is added. Since copper sulphate liberates iodine from the solution, the presence of any unreduced copper sulphate will be indicated by a blue coloration.

found to be hardly as convenient as the foregoing method. It was necessary in the case of syrup hypophosphites to have the Fehling's Solution strongly alkaline in order to neutralize the acidity of the syrup, and so inhibit the reducing power of the hypophosphorous acid.

2d. The undiluted syrup was polarized in a 100-Mm. tube at  $21^{\circ}$  C. and the optical rotation  $[\alpha_D]$  determined. The instrument used for this purpose was a Schmidt & Haensch half-shadow polariscope.

This examination was continued through a period of twenty weeks, and the results obtained are tabulated below. I have thought it advisable also to embody the results in the form of curves, as the clearer and more concrete mode of presentation to the eye. There being no change in syrup No. 3, no curves are given for it, they being merely horizontal straight lines.

From an examination of the curves, the following points may be noted: In No. 1, syrup hypophosphites U. S. P., the conversion is very slow, at the end of twenty weeks only 19 per cent. of the cane sugar being inverted. Compared with this, the conversion in No. 2 is rapid, more than 82 per cent. of its cane sugar being inverted in the same time. This might be expected from the greater acidity of No. 2, containing as it does 0.15 per cent. of absolute hypophosphorous acid against 0.02 per cent. in No. 1.

With syrup calcium lactophosphate, however, the change is more marked, for we find that with both No. 4 and No. 5 conversion is complete at the end of twenty weeks, all the cane sugar originally placed in these syrups being converted into glucose.

Syrups No. 6 and No. 7, prepared with citric and lactic acids, also show marked changes in cane-sugar content. In No. 6, prepared with citric acid, fully 73 per cent. of the cane sugar is inverted in eighteen weeks, while No. 7, with lactic acid, follows closely with 67 per cent. inverted in the same time.

The rate of inversion in each case is fairly uniform, although, as the process approaches completion, the rate gradually diminishes. Any irregularities may be looked upon as being due to temperature changes.

The curves showing changes in optical rotation, while not giving directly any quantitative relations, show clearly the decrease in quantity of the dextrorotatory cane sugar, and serve as a check upon the results obtained by titration.

It may be well to mention that, at the end of these investigations, all the syrups, with the exception of Nos. 4 and 5, remained fairly clear and free from coloration. Nos. 4 and 5, the syrups of calcium lactophosphate, had acquired a distinct brown tint due probably to caramelization of a portion of the cane sugar, or to the formation of so-called humin substances from the decomposition of levulose. All the syrups had lost to a greater or less degree the original sweet taste given by the cane sugar, and each had acquired a thicker consistency.

The important points brought out may now be summarized as follows:

1st. The cane sugar of syrup hypophosphites U. S. P. is inverted, under ordinary conditions, at the rate of about 4 per cent. per month, and that of syrup calcium lactophosphate U. S. P. is inverted at the rate of about 15 per cent. per month. An increase in the acidity of these preparations increases the rate of inversion.

2d. The use of organic acids in the place of inorganic acids does not prevent the process of inversion taking place.

As before mentioned, it was after the conclusion of the work recorded above, that the investigations of Haussmann and of Woltersdorf and Richtmann came to my notice, and I am pleased to note that the results agree very closely. While adding but little to the information already at hand, I trust that the results may be of some interest to the profession and with this in view I have presented them.

I wish to thank Dr. H. Engelhardt, at whose initiative this work was undertaken, for advice and assistance in carrying it out.

SYRUPS PREPARED JANUARY 28.

Date.	No. 6. Syrup Hypophosphites, with Citric Acid.		No. 7. Syrup Hypophosphites, with Lactic Acid.	
	Optical Rotation.	Invert Sugar Gm. per 100 Cc.	Optical Rotation.	Invert Sugar Gm. per 100 Cc.
Jan. 28 ...	+ 42.4°	None.	+ 42.5°	None.
Feb. 11 ...	+ 39.8°	2.80	+ 40.4°	2.3
Feb. 25 ...	+ 36.1°	6.67	+ 37.5°	5.6
Mar. 10 ...	+ 32.8°	10.52	+ 34.7°	9.1
Mar. 24 ...	+ 28.1°	15.87	+ 30.6°	13.5
Apr. 7 ....	+ 22.6°	22.72	+ 25.8°	19.2
Apr. 21 ...	+ 18.1°	28.0	+ 21.6°	25.1
May 5 ....	+ 12.0°	41.1	+ 16.2°	35.2
May 19 ...	+ 7.5°	44.5	+ 11.8°	36.8
June 2 ....	+ 0.9°	49.0	+ 5.6°	44.9



## SYRUPS PREPARED JANUARY 9.

Date.	No. 1. Syr. Hypophosphites U. S. P.		No. 2. Syr. Hypophosphites. Special.		No. 3. Same as No. 1. Without Acid.		No. 4. Syr. Calcium Lactophosphate U. S. P.		No. 5. Syr. Calcium Lactophosphate. Special.	
	Optical Rotation.	Invert Sugar Gm. per 100 Cc.	Optical Rotation.	Invert Sugar Gm. per 100 Cc.	Optical Rotation.	Invert Sugar Gm. per 100 Cc.	Optical Rotation.	Invert Sugar Gm. per 100 Cc.	Optical Rotation.	Invert Sugar Gm. per 100 Cc.
Jan. 11. . .	+42.7°	Trace.	+41.9°	2.3	+43.7°	None.	+44.0°	6.2	+43.7°	9.4
Jan. 25. . .	+41.9°	0.7	+36.0°	7.3	Same.	"	+31.7°	16.1	+23.5°	26.3
Feb. 8. . .	+41.5°	1.3	+32.3°	11.9	"	Trace.	+24.0°	25.0	+12.8°	40.0
Feb. 22. . .	+41.0°	1.9	+27.4°	17.8	"	"	+15.5°	34.2	+2.8°	50.0
Mar. 7. . .	+40.3°	2.3	+23.6°	21.7	"	"	+10.0°	43.4	-3.1°	58.8
Mar. 21. . .	+39.3°	3.3	+17.3°	29.4	"	"	+1.8°	50.0	-10.1°	66.7
Apr. 4. . .	+38.1°	4.3	+11.1°	38.4	"	"	-5.0°	61.2	-14.4°	68.9
Apr. 18. . .	+37.0°	5.7	+6.3°	41.8	"	"	-8.9°	64.5	-15.7°	70.0
May 1. . .	+35.2°	7.1	+0.9°	47.5	"	"	-12.8°	68.5	-17.0°	77.1
May 16. . .	+33.4°	10.7	-3.4°	48.0	"	"	-15.0°	68.5	-18.5°	77.7
May 30. . .	+31.4°	12.3	-7.1°	55.0	"	"	-15.5°	73.1	-18.5°	77.7

## COMPARISON OF VOLUMETRIC METHODS FOR THE ESTIMATION OF PHOSPHORIC ACID.

BY VIRGIL COBLENTZ AND OTTO B. MAY.

In the following experiments a sample of phosphoric acid of specific gravity 1.7027 was employed. Gravimetric assays, as magnesium pyrophosphate, gave a phosphoric acid content of 84.70, 84.68 and 84.53 per cent., average 84.62 per cent., of absolute phosphoric acid. According to the U. S. P. tables, an acid of 1.7027 specific gravity should contain 84.71 per cent. of absolute acid. The difference in the U. S. P. specific gravity of 84 and 85 per cent. acids is 0.0117; then according to this a difference of 0.0001 would correspond to only 0.0085 per cent. Assuming this factor to be correct, the specific gravity of 1.7027 would indicate the presence of 84.67 per cent. of true phosphoric acid.

Of this acid 23.2025 Gm. were diluted to 1000 Cc. at 25° C.; this diluted acid had a specific gravity of 1.0111 and contained, according to the gravimetric assay, 1.94 per cent. of absolute acid. When calculated according to the U. S. P. tables it should contain 1.99 per cent. of phosphoric acid. Accepting the phosphoric acid strength of 84.71 per cent. (of the original acid) as based on the tables, the per cent. of this diluted acid should be 1.959. The gravimetric assay of this diluted acid (1.94 per cent.) was accepted as the standard in the following experiments:

No. 1. *Uranium Method.*

Since the details of this method are familiar to all they are omitted. The standard uranium acetate employed was standardized by means of a pure disodic phosphate solution, the strength of which was ascertained by evaporating an aliquot part and heating the residue until of constant weight. This normal solution was still further checked by means of sodium-ammonium acid phosphate (Classen, Anal. Chem., vol. 2, p. 573).

Taken, Mgm.	Found, Mgm.	Difference, Mgm.	Strength, per cent.	Difference, per cent.
10 Cc. or 196.3	195.6	—0.7	84.3	—0.32
10 Cc. or 196.3	196.4	+0.1	84.67	+0.05
10 Cc. or 196.3	194.8	—1.5	83.96	—0.66

It will be seen that the results tally closely with those of the gravimetric method. Considerable skill and practice are necessary in securing accurate results. The adoption of this method would necessitate the introduction of two more standard solutions to our already large list.

No. 2. *Iodine Method*, U. S. P.

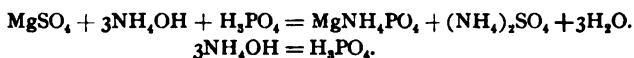
In an accurately filled glass-stoppered bottle of about 150 Cc. capacity, 10 Cc. of  $H_3PO_4$  are introduced, followed by approximately 2 Gm. of potassium iodide, 5 Cc. of a saturated solution of potassium bromate and 30 Cc. of water. After 3 hours' standing in the securely-stoppered flask at room temperature, the liberated iodine is estimated with sodium thiosulphate V. S. (Christensen, Jahresber. d. Pharm, 96, 338).



Taken, Mgm.	Found, Mgm.	Difference, Mgm.	Strength, per cent.	Difference, per cent.
10 Cc. or 196.3	196.4	+0.1	84.67	+0.05
10 Cc. or 196.3	195.5	-0.8	84.26	-0.36
10 Cc. or 196.3	196.4	+0.1	84.67	+0.05
10 Cc. or 196.3	195.2	-1.1	84.12	-0.50

## No. 3.

This method consists of adding a measured excess of ammonia water of a known titer, followed by sufficient magnesium sulphate solution to precipitate the phosphoric acid as magnesium-ammonium phosphate, then estimating the uncombined ammonia in an aliquot portion of the filtrate (C. Gluecksman, *Zeitschr. f. analyt. Chemie*, '95, 36). The reaction is as follows:

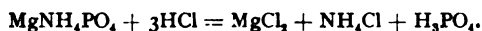


Taken, Mgm.	Found, Mgm.	Difference, Mgm.	Strength, per cent.	Difference, per cent.
10 Cc. or 196.3	202.3	+6.0	87.21	+2.59
10 Cc. or 196.3	194.6	-1.7	83.86	-0.76
10 Cc. or 196.3	198.5	+2.2	85.54	+0.92
10 Cc. or 196.3	199.4	+3.1	85.94	+1.32

The high results obtained are due to the fact that the phosphoric acid precipitation does not take place altogether as indicated in the above equation, by the formation of the normal magnesium-ammonium phosphate (Neubauer, *Ztschr. f. anal. Chemie*, '94, 362). Furthermore, ammonia is readily lost in handling the precipitate.

## No. 4.

Estimation through the solution of the precipitate of magnesium-ammonium phosphates (washed with alcohol to remove adhering ammonia) in a measured excess of  $\frac{N}{10}$  acid V. S. and titrating back with  $\frac{N}{10}$  alkali V. S. (A. Hebebrand *Zeitschr. f. anal. Chemie*, '98, 217.)



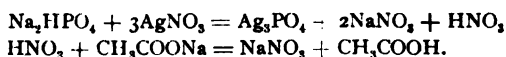
Taken, Mgm.	Found, Mgm.	Difference, Mgm.	Strength, per cent.	Difference, per cent.
10 Cc. or 196.3	199.9	+3.6	86.20	+1.58
10 Cc. or 196.3	197.5	+1.2	85.12	+0.50
10 Cc. or 196.3	198.5	+2.2	85.54	+0.92
10 Cc. or 196.3	198.9	+2.6	85.75	+1.13

Through the solution of the magnesium-ammonium phosphate in a measured excess of  $\frac{N}{10}$  V. S. of an acid, phosphoric acid is liberated, but the estimation of this by titration brings up the same difficulties en-

countered in the alkalimetric estimation of the acid. The high results are then due to the ionization of this acid as already pointed out. (Amer. Jour. Phar., April, 1908.)

No. 5.

Estimation by  $\frac{N}{10}$  silver nitrate V. S. (Holleman, Zeitschr. f. anal. Chemie, '94, 85.) The phosphoric acid is converted into a bi-phosphate through the addition of  $\frac{N}{10}$  KOH V. S. until phenolphthalein turns red.  $H_3PO_4 + 2KOH = K_2HPO_4 + 2H_2O$ . Sufficient sodium acetate solution is then added to neutralize the nitric acid liberated by the silver nitrate V. S. which is added in an accurately measured excess.



The mixture is then made up to 100 Cc. and the excess of  $AgNO_3$  V. S. estimated in an aliquot part of the filtrate according to Volhardt.

Taken, Mgm.	Found, Mgm.	Difference, Mgm.	Strength, per cent.	Difference, per cent.
5 Cc. or 98.15	97.94	-0.21	84.42	+0.20
5 Cc. or 98.15	98.59	+0.44	84.98	+0.36
5 Cc. or 98.15	99.56	+1.41	85.82	+1.20
5 Cc. or 98.15	99.24	+1.09	85.54	+0.92

This method yields fairly concordant results. Any irregularities are probably due to the decomposition of the silver salt in acetic acid solution. Halogens must be absent.

No. 6.

Determination by titrating with  $\frac{N}{25}$   $Ca(OH)_2$  V. S. in the presence of  $AgNO_3$  employing phenolphthalein as indicator. The silver nitrate V. S. added should be slightly less in volume than that necessary to precipitate the  $H_3PO_4$ . (Lyons, Amer. Druggist, Apr., '08).

Taken, Mgm.	Found, Mgm.	Difference, Mgm.	Strength, per cent.	Difference, per cent.
5 Cc. = 98.15	101.5	+3.35	87.49	+2.87
5 Cc. = 98.15	101.02	+2.87	87.08	+2.46
3 Cc. = 58.89	59.99	+1.1	86.19	+1.57
2.5 Cc. = 49.07	50.26	+1.19	86.62	+2.00
2.5 Cc. = 49.07	50.43	+13.6	86.93	+2.31
2 Cc. = 39.26	40.54	+1.28	87.35	+2.73

This method is tedious and requires three standard solutions. The substitution of the standard calcium hydroxide as proposed by Lyons in place of sodium acetate (Holleman method, No. 5), offers no advantage, since the silver nitrate solution is decomposed more readily in the alkaline solution than in acid. Again the calcium hydroxide V. S. must be standardized each time before using.

## No. 7.

Determination by the precipitation of the phosphoric acid as silver phosphate, in the presence of calcium hydroxide, dissolving the silver phosphate in nitric acid and estimating according to Volhard.

Taken, Mgm.	Found, Mgm.	Difference, Mgm.	Strength, per cent.	Difference, per cent.
5 Cc. = 98.15	99.89	+1.74	86.10	+1.48
5 Cc. = 98.15	99.56	+1.41	85.82	+1.20
5 Cc. = 98.15	100.2	+2.05	86.38	+1.76
5 Cc. = 98.15	99.7	+1.55	85.94	+1.32

## No. 8.

Determination by precipitation with measured excess of silver nitrate V. S. in the presence of an excess of calcium hydroxide, and then estimating the uncombined excess of silver nitrate V. S. in an aliquot part of the filtrate according to Volhard. (Lyons, 1 Cc.)

Taken, Mgm.	Found, Mgm.	Difference, Mgm.	Strength, per cent.	Difference, per cent.
5 Cc. = 98.15	100.53	+2.38	86.66	+2.04
5 Cc. = 98.15	100.2	+2.05	86.38	+1.76
5 Cc. = 98.15	100.69	+2.54	86.80	+2.18

The precipitated silver phosphate leaves, after treatment with diluted nitric acid, upon the filter, a slight insoluble residue of reduced metallic silver. As it is not possible to remove all the adhering silver solution without loss or decomposition of part of the silver phosphate, the results must necessarily be high.

## No. 9.

As shown by the results obtained in all the methods where silver nitrate is employed (6, 7 and 8) in alkaline solution, it is not possible to obtain concordant and satisfactorily accurate results. Even the weak acetic acid solution as is employed in Hollemann's method (5), apparently reacts with the silver phosphate. If the silver phosphate be precipitated in an absolutely *neutral* solution, these disadvantages should be overcome. Such a condition would be fulfilled if the precipitate of magnesium-ammonium phosphate, after washing with alcohol, is macerated with silver nitrate solution, silver phosphate is then formed with magnesium and ammonium nitrates passing into solution. This method is carried out by adding sufficient ammonia water to a solution of 0.1 Gm. of phosphoric acid until faintly alkaline, then sufficient magnesia mixture is added and after standing for ten minutes, 15 Cc. of ammonia water are added and the precipitate is set aside for one hour. The supernatant fluid is then removed by filtration, the container and filter washed with neutral 90 per cent. alcohol (about 40 Cc.).

It is preferable to precipitate the phosphoric acid in a 200 Cc. flask,

then wash by decantation, passing the washings through a filter. After washing with alcohol, the precipitate is returned to the original container, an excess of  $\text{AgNO}_3$  V. S. added (about 40 Cc. for 0.1 Gm.  $\text{H}_3\text{PO}_4$ ), and the mixture made up to the 200 Cc. mark. After 24 hours standing in the dark, frequently shaking, 100 Cc. are filtered off and the excess of silver nitrate estimated according to Volhard. It has been found that the interaction between the silver nitrate and the magnesium-ammonium phosphate is very much slower when the latter is in crystalline state than when precipitated cold. In order to avoid the introduction of chlorides, the magnesia mixture should be made up of the sulphates only.

Taken, Mgm.	Found, Mgm.	Difference, Mgm.	Strength, per cent.	Difference, per cent.
5 Cc.=98.15	97.29	-0.86	83.86	-0.76
" "	97.61	-0.54	84.13	-0.49
" "	98.27	+0.12	84.70	+0.08
" "	97.62	-0.53	84.14	-0.48
" 71.10	71.02	-0.08	84.53	-0.09
" "	70.70	-0.40	84.14	-0.48
" "	71.35	+0.25	84.92	+0.30
" "	71.35	+0.25	84.92	+0.30
101.57	101.73	+0.16	84.84	+0.22

While this method demands more time than that of Hollemann (5), yet it apparently yields accurate and concordant results, and can be applied to any of the salts of phosphoric acid, even though chlorides may be present. Upon comparing the figures of the tables one will note that while the differences in the quantities of the acid *taken* and *found* may be very slight, almost negligible, yet when calculated into percentages of absolute acid, yield marked differences. This multiplication of possible error due to slight differences in weighing is unavoidable as long as small quantities are taken for analysis. Further experiments are in progress, and a report will be made later in criticism of this latter method.

#### *Crystalline Phosphoric Acid.*

Through the kindness of Dr. Lyons, a sample of crystalline phosphoric acid was submitted for examination. This consisted of a hygroscopic mass of long acicular crystals, from which, after thorough draining, well defined crystals were selected, dried between the folds of filter paper, and the melting-point taken at once. The melting-point was between  $31^\circ$  and  $32^\circ$  C. The specific gravity was 1.7563 at  $25^\circ$  C.

Its content in absolute phosphoric acid was :

Gravimetric.....	90.85 per cent.
Hollemann method (5) .....	90.63 "
	90.92 "
	90.58 "

Theoretically, a salt of the composition  $2\text{H}_3\text{PO}_4 \cdot \text{H}_2\text{O}$  would contain 91.53 per cent. of absolute acid. From the above results we will assume that this crystalline acid contains one-half molecule of crystal water.

#### DÉTERIORATION OF DILUTED HYDROCYANIC ACID.

BY VIRGIL COBLENTZ AND OTTO MAY.

The subject of the deterioration and preservation of diluted hydrocyanic acid is an old and troublesome problem which most pharmacopœias avoid by either introducing extemporaneous processes or by omitting altogether. Although our official extemporaneous process affords all that can be desired, yet the market acid, with its variability in strength, is still largely in use. The question naturally arises, Is it possible to prevent this deterioration? This has been answered, in a way, by our manufacturers, through the addition of a small amount of hydrochloric acid and preservation in an amber-colored bottle.

Further questions as to the cause of this deterioration, length of time these solutions retain their initial strength, other preservatives than inorganic acids, naturally attract our attention. A perusal of the literature on this subject affords us a few general and some conflicting statements; thus Bussy and Buignet (*Journ. Phar. et Chem.* '63, 475) claims that alteration goes on very rapidly in the dark when it has once begun under the influence of light; that is, exposure to light is the primary cause of the decomposition of hydrocyanic acid solutions. M. E. Millon (*U. S. D.* 41), found as he states, the real agency of the change was the presence of ammonia, while another unknown writer claims this change to be due to the presence of a microærobic organism. The action of ammonia in inducing changes in diluted hydrocyanic acid is denied by Pellit (*Arch. S. Phar.* 1873). Other writers have claimed that the acid acts upon the alkali of some kinds of glass and that foreign matter, thus introduced, is the cause of change. Siebold (*Ph. C.*, Sept. '74) who confirms this, states that the addition of hydrochloric acid is useless as a preservative except when prussic acid is kept in bottles that yield alkali. Lescolin and Rigaut (*Compt. rendus*, Aug. 4, '79) claim that pure hydrocyanic acid can be preserved for a long time, but the presence of an alkali cyanide causes decomposition even in the absence of water. The U. S. Dispensatory states that "experience has shown that it is best preserved in cork-stoppered bottles of amber glass; when glass or rubber stoppers are used, decomposition frequently took place rapidly." In order to ascertain whether or not light plays an important part in the decomposition of this acid, all experiments were made in duplicate, one set being exposed to strong diffused light in colorless, cork-stoppered vials, while the others were kept in dark, amber-colored ones. Duplicate experiments were made in nearly all instances, employing acids made by distillation from potassium ferrocyanide and diluted sulphuric acid and the alternative silver cyanide process. The bottles used for

preserving the acid were all thoroughly washed with dilute acid and clean water. In order to determine the influence of alkali possibly taken up from the containers, experiments were carried out in vials which were completely coated inside with a layer of paraffin. The preservative action of acetanilide, which does such excellent service in the case of hydrogen dioxide, and also that of alcohol, were tried in addition to that of the usual hydrochloric acid. In order to simplify comparison, the original percentage strength of each sample (2 per cent. or thereabouts) was set at 100 and the deterioration was calculated on this basis.

Month.	1. Plain solution— Paraffin bottles.				2. Plain Solution.				3. Traces of Ammonia.			
	AgCN.		K <sub>4</sub> FeCN <sub>6</sub>		AgCN.		K <sub>4</sub> FeCN <sub>6</sub>		AgCN.		K <sub>4</sub> FeCN <sub>6</sub>	
	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.
1.....	100	100	100	100	100	100	100	100	100	100	100	100
2.....	100	100	99.5	99.5	100	98	88.3	80.4	100	98.7		
3.....	99	96.6	95.6	99	100	98	69.6	78.5	96.5	98.6		
4.....	99	96.6	92.2	91.2	95.2	94.3	57.8	63.7	94.2	98.4		
5.....	97.7	96.6	91.2	77	95.2	94.3	48	54	92	93		
6.....	96.5	95.4	90.2	70.6	93.4	86.2	48	50	82.8	91		
7.....	93.7	93.7	89.2	58.8	88.6	71.3	47	46	76.5	86		
8.....	93.7	93.7	85.3	53.0	84.5	69.0	36.1	38.2	57.5	86		
9.....	93.7	93.7	85.3	46.0	83.3	67.8	24.5	29.5	29.5	86		

Month.	4. 50 per cent. Alcohol.				5. 1 per mille Solution Acetanilide.				6. Addition of Hydro- chloric Acid.			
	K <sub>4</sub> FeCN <sub>6</sub>		AgCN.		K <sub>4</sub> FeCN <sub>6</sub>		AgCN.		K <sub>4</sub> FeCN <sub>6</sub>		AgCN.	
	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.
1.....	100	100	100	100	100	100	100	100	100	100	100	100
2.....	100	100	100	100	100	100	100	100	100	100	99.4	88.5
3.....	99	99	100	100	100	100	96.5	96.5	100	100	97	97
4.....	94.3	95.8	100	100	96.2	96.2	96.5	93.7	99	99	97	97
5.....	93.7	93.7	97.5	97	96.2	93.4	96	91	97	95.8	96	96.6
6.....	93.7	93.7	95	95	95.8	93.4	94.3	89.6	96.2	95.3	94.7	92
7.....	92.7	92.7	91	93.5	93.9	93	93.7	87.4	96.2	94.3	93.6	88.5
8.....	92.7	92.7	91	93.5	93.7	91.5	93.7	87.4	93.4	90.5	91.8	87.3
9.....	92.7	92.7	91	93.5	92.7	89.6	93.7	87.4	90.5	84.8	80.7	86.2



The decomposition of diluted hydrocyanic acid is, without doubt, a process of slow saponification, yielding ammonium formate,  $\text{HCN} + 2\text{H}_2\text{O} = \text{HCOONH}_4$ , also a brown flocculent precipitate forms in solutions containing ammonia; this is, possibly, a polymerization product. These decompositions, which, as has been pointed out by Lescollm and Rigaut, take place only in dilute solutions, and are favored by the presence of alkalies (cyanides). This will be seen on comparing tables 1, 2 and 3. Observe the total loss in 9 months in sample 1, kept in paraffined bottles; a total of about 6 per cent., while that of No. 2, kept in plain glass bottles, varies from about 10 to 54 per cent., and sample 3, containing traces of ammonia, the loss varies from 14 to 75.5 per cent. We also note, in general, that diffused light plays no uniform important part in the decomposition or loss in HCN. The acid made from silver cyanide usually keeps better than that made by the distillation from the ferrocyanide. This may be explained through the traces of hydrochloric acid present, used in securing the decomposition of the silver cyanide. The employment of diluted alcohol as menstruum, or the addition of acetanilide, offer no material advantages over hydrochloric acid as preservatives, while from our experiments, practically as much may be expected from neutral containers. Further experiments are being made to be reported on at a later date.

#### TESTING OF BISMUTH SALTS FOR ARSENIC.

BY VIRGIL COBLENTZ AND OTTO MAY.

Owing to the comparatively large dosage and the frequency with which bismuth salts are administered, the question of the tests for arsenic and its limitation is an important one. In the last pharmacopœial revision we directed that all the salts of this metal be ignited and, in order to insure complete destruction of the organic matter, subsequent moistening with nitric acid and reignition. Dr. Lyons calls attention to his experiments on commercial samples of the subnitrate and ammonio-citrate, in which he finds much more than traces of arsenic in these, while the U. S. P. tests were applied with negative results. The author claims that if only sufficient heat is used in driving off the nitric acid, the arsenic can be readily detected. Dr. Lyons recommends boiling the ignited salt with a solution of potassium hydroxide for the removal of the bismuth, and testing the filtrate by the official Modified Gutzeit Test.

The question that now arises is, Is there any loss in arsenic entailed through ignition *with or without* nitric acid as directed in the U. S. P. test? For these experiments a sample of pure bismuth citrate, free from arsenic, was prepared.

(a) Samples of about 2 Gm. each of the bismuth citrate, after the addition of 3 Cc. of a solution of arsenous oxide, containing 0.003 Mgm. of  $\text{As}_2\text{O}_3$ , were evaporated and ignited for periods of from 10 to 60 minutes. The residue, after boiling with a solution of potassium hydroxide, filtering

and acidifying, were tested quantitatively in the Marsh-Berzelius apparatus. In each of five experiments the mirror obtained corresponded identically with that from 0.003 Mgm. of pure arsenous oxide.

(b) Samples of about 2 Gm. of the bismuth citrate, after the addition of 3 Cc. of a solution of pure arsenous oxide, containing 0.003 Mgm., were evaporated and ignited. The residue was then moistened with nitric acid, dried and ignited as in the U. S. P. After heating the residue with a solution of potassium hydroxide, filtering, acidifying and introducing into the Marsh-Berzelius apparatus, the following represent the results of ten repetitions of this experiment: (1) No mirror; (2) 0.001 Mgm.  $\text{As}_2\text{O}_3$ ; (3) Traces; (4) 0.001 Mgm.  $\text{As}_2\text{O}_3$ ; (5) Traces; (6) No mirror; (7) No mirror; (8) No mirror; (9) Traces; (10) No mirror.

(c) In order to avoid the re-ignition of the ignited bismuth citrate, after treating with nitric acid, which is done for the purpose of removing the adhering traces of this acid, 2 Gm. of the citrate, after adding 0.003 Mgm. of the arsenous acid (in solution), was dried, ignited, moistened with nitric acid, and again evaporated to dryness. To this residue 3 Cc. of sulphuric acid was added, and the mixture heated until the fumes of sulphuric anhydride made their appearance. This residue, after heating with a solution of potassium hydroxide, filtering and acidifying, was tested quantitatively in the Marsh-Berzelius apparatus. Experiment (1) 0.001 Mgm.  $\text{As}_2\text{O}_3$ ; (2) No mirror; (3) No mirror; (4) Traces; (5) No mirror.

(d) To 2 Gm. quantities of arsenic-free bismuth subnitrate, 0.003 Mgm. of arsenous oxide was added, followed by gentle ignition with some samples and strong ignition with others. The results obtained from repeated trials were as varied and unsatisfactory as those under experiment b.

From the preceding we observe that no loss of arsenic is incurred through simple ignition of the salts of bismuth, even when continued for one hour. If nitric acid is present, even to the extent of traces, a loss in arsenic will occur, apparently commensurate with the quantity of acid present. This loss of arsenic occurs, in all probability, through the decomposition of the arsine gas by the oxides of nitrogen, when in the Marsh apparatus or any other, which depends upon the generation and identification of arsine. It is very difficult to remove the last traces of nitric acid from a bismuth ash, therefore its use should be avoided. It will be noted then that bismuth subnitrate will not yield its arsenic quantitatively as arsine, hence no attempt was made to include it in the subsequent tests. Further experiments are being made with this salt and will be reported upon later.

Presence of arsenic in commercial bismuth salts. Whether the presence of arsenic in our bismuth salts is of medicinal consequence or not, there must be a recognized reasonable limit, such as is laid down in our Pharmacopœia. Whether our market supply exceeds this or not was

deemed of sufficient interest to warrant an examination. The estimation of minute quantities of arsenic can be carried out with considerable accuracy by means of a modification of the well-known Marsh-Berzelius test, such as was proposed by H. B. Bishop (Jour. Amer. Chem. Soc., 1906, p. 178). The chief innovation in this proposed modification is the employment of a small generating flask, of about 30 Cc. capacity, using 10 per cent. hydrochloric acid. With 0.002 Mgm. of  $As_2O_3$  an appreciable, distinct, metallic deposit may be obtained. Having prepared mirrors representing 0.002, 0.003, 0.004, 0.005 and 0.006 Mgm. of arsenous oxide, these served as standards for comparison. The following results represent a very flattering showing on the part of our American manufacturers.

These figures represent parts in 100,000.

Bismuth.	Subcarbonate.	Citrate.	Subgallate.	Salicylate.	Ammonio-Citrate.
Merck .....	free	0.20	0.10	0.10	0.10
Mallinckrodt .....	0.15	0.05	traces	0.10	0.15
Pfizer .....	0.15	0.10	0.15	free	0.15
P. W. R. . . . .	free	0.25	0.10	free	traces
Squibb .....	free	0.15	0.10	free	0.10

## THE ACETIC ACID FLUIDEXTRACTS OF THE U. S. P., VIII.

BY JOSEPH FEIL.

The introduction of ten per cent. acetic acid as a menstruum for fluid-extracts in the last revision of the Pharmacopœia deserves a greater recognition than it has received to date.

First: The menstruum is a better solvent for the medicinal substances of many drugs than alcohol, and as this is the important value of a menstruum it should be given preference over all other considerations.

Second: Alcoholic liquids are practically prohibited in veterinary practice, and they were best limited for human use also, and therefore the acetic preparations have found a large use by veterinary surgeons.

An important idea suggests itself here. Why does not our Pharmacopœia give recognition to remedies in this line of medical preparations? Pharmacists are continually called on to prepare medicines of this nature, and finer breeds of animals are continually being introduced into this coun-

try, besides which, the practitioners of this branch of the healing art are increasing in number and intelligence, and it seems, therefore, that at least one member of the next Revision Committee of the U. S. P. should be a D. V. S. This perhaps might likewise apply to the dental profession and a D. D. S. also be made a member.

I have in my possession some of the acetic fluidextracts prepared ten years ago by the firm of E. R. Squibb & Sons, and a comparison of the official ones with these is of interest at the present time.

*Squill.* The amount of precipitate in the old preparation is slight, the odor is ethereally pleasant, and the taste is sufficiently nauseating to indicate decided medicinal value. Titration indicated about six per cent. acetic acid, while the fresh preparation with a less agreeable odor titrated seven and seven-tenths per cent. acetic acid. This preparation keeps well and is an undoubted success.

*Lobelia.* Whatever has been said above of squill holds equally true here. The titrations show six and six-tenths per cent. acetic acid for the old, and seven and one-tenth per cent. for the new.

*Bloodroot.* The amount of precipitate in the old preparation is enough to give a rather unsightly appearance, and the odor is not as pleasant as a recently prepared article; the taste, however, is about as acrid, indicating that the medicinal activity is not impaired. The amount of the precipitate is about what is generally found in many alcoholic preparations. The titration indicates for the old fluidextract seven and one-tenth per cent., and for the fresh preparation seven and seven-tenths per cent. of acetic acid.

The titrations were made with decinormal sodium hydroxide and phenolphthalein.

*Summary.* The acetic fluidextracts keep well, and their number could be extended, especially for veterinary practice. They lose acidity on standing, which loss varies for each particular preparation.

*Cleveland, O., July 25, 1908.*

Mr. Francis said that in looking over the paper by Mr. Feil, he was impelled to say that he disagreed with the gentleman on practically every point that he brought out in his paper. In the first place, experience warranted investigators in stating that acetic acid as a menstruum is inferior to alcohol. Second, we do not know anything as to the extractive value of 10 per cent. acetic acid, substituted for alcoholic menstrua in our preparations. Third, that his practical experience in the case of fluidextracts made by acetic acid showed that these extracts were never as stable as alcoholic fluidextracts. They have a greater tendency to precipitate, and he did not think he had ever made one—and he had made quite a large number—that did not precipitate sooner or later. He considered acetic acid to be a very inferior extractive menstruum.

In the case of bloodroot—which was the one he had selected—it was capable of a rough kind of assay; but his experience showed that it was very difficult to extract more than 75 per cent. of the active alkaloids. Fluidextract of squill tested low physiologically, when made by the acetic acid method, as compared with the alcoholic fluidextract. He had also obtained the same results in a general way where acetic acid was used in preparing such fluidextracts as belladonna, digitalis, cannabis and other drugs. He did not think the evidence cited in the paper as to the physical appearance of these preparations being an indication of their worth as of any value. He regretted that Mr. Feil was not present, and he disavowed making his remarks in any unkind spirit of criticism, but said he considered the acetic acid processes as introduced in the United States Pharmacopœia a mistake; or, if not a mistake, a matter for very careful reconsideration. “Why,” he asked, “if we have satisfactory fluidextracts now made by the use of alcohol, should we take up a process like this, which certainly is no better?” The matter of price is something, he said, but he did not believe the retail pharmacists of the country ever gained anything in the end by cheapening the price. He did not want cheap extracts and cheap tinctures; they would not be consumed in greater quantities because of the price, and competition would finally force all prices on these cheap extracts down to the same dead level, in the course of time. He did not see that it was to the advantage of the pharmacists or anybody else to adopt acetic acid extracts, and he regarded them as very inferior.

Mr. Asher complimented Mr. Francis for the stand he had taken in regard to acetic acid extracts. He had been under the same impression as a great many pharmacists who had not had the experience that Mr. Francis had had in regard to the therapeutic action of these preparations. This reminded him of the article written by Dr. Squibb urging acetic acid for fluidextracts. He knew of a firm that substituted these acetic acid extracts in place of those made with alcohol, so as to be able to meet competition.

Mr. Francis had called attention to one point that pharmacists generally would recognize the importance of: That the therapeutic value of these extracts made with acetic acid is lacking, and pharmacists should not sacrifice to a matter of dollars and cents the efficiency of their preparations.

The General Secretary said he supposed a majority of the gentlemen present were aware of the fact that the Committee of Revision had introduced a few acetic acid fluidextracts for the express purpose of experimentation. Dr. Squibb was an urgent advocate of an acetic acid menstruum, and it was pressed so strongly on the committee to give it a fair trial that the committee thought it wise to select three or four of these extracts with a view of bringing out the true merits of the preparations, so that the committee at the next Pharmacopœial Convention might act more intelligently. This action was not taken to foist acetic acid fluidextracts on the professions of either medicine or pharmacy; it was meant as an experiment

only. So much had been written about the process, that the committee felt compelled to give it a chance by introducing a few fluidextracts (3 in number) of drugs which seemed particularly applicable to that line of exhaustion. If the experiments made before the next convention meets are unfavorable, he had no doubt the committee would drop them hereafter. He said he happened to be one of the sub-committee on extracts, and gave this as his reason for speaking as he did.

Mr. Hallberg, discussing the paper, said he was sorry that the author of it was not present, but he had evidently written this paper out of his imagination. It is never proper to sacrifice a principle to a per cent. of profit. He reminded the members that at the Put-in-Bay meeting of the Association some years ago, there was a complete exhibit of acetic acid fluidextracts made by Squibb and Son. At the request of the manager there, this exhibit had been sent to his college in Chicago, and it had been kept there ever since. He was now prepared to say that out of the whole collection there was probably not over a half a dozen that were not so badly precipitated that they could not be used. He said most of this collection was still on hand, and he had examined it every year since, and the number that could be used was very limited, the balance being so badly precipitated that they could not possibly be used. His observation taught him to believe that the use of acetic acid for fluidextracts containing tannin was especially objectionable.

Replying to a question by Mr. Francis as to nux vomica, Mr. Hallberg said it was all right in that case. He also said it could be used to advantage in ergot and in one or two other drugs, that was all. In most instances it was absolutely of no use. Anyhow, he said, this was a reversion to the original method of making galenicals, before alcohol was used, and he hoped that this experience with acetic acid fluidextracts would be conclusive of this matter, and that no more would be heard about fluidextracts made in this way. He said that when the Association met in Chicago again they would have an opportunity to look at this exhibit if desired.

Mr. Kebler said his experience had been similar to that of Mr. Francis, as far as he had gone. Mr. Feil seemed to recommend or advise the use of this material very largely. He did not believe in discouraging in any way experimentation with drugs, and that every effort should be made to get at the facts; but he thought it was improper to recommend the use of a product that had not been fully tried. He said that those members who could look back for ten or fifteen years would recall the wood alcohol situation, and would remember the great number of papers presented on that subject, to the effect that wood alcohol was a good solvent. Nobody thinks of using wood alcohol for that purpose now, however, for their eyes have been opened.

The Chair said it was a matter of regret that only one of the papers read by title could be discussed, because it is discussion that brings out

the valuable points of a paper and emphasizes them, and points out the difference of opinions and conclusions from those of the authors of the papers, and in that way makes the meetings full of interest and of real value.

He was glad Mr. Francis had brought up this question of acetic fluid-extracts. It does not by any means follow that the Scientific Committee endorses all of the papers that it accepts; it is the intention at the time of accepting papers that they shall be read and discussed, and it follows that during the discussion it will be possible to bring out opinions differing from those of the author of the paper. He thought that was what these meetings were primarily for; otherwise the papers could simply be printed and distributed and no meetings held. His own views accorded substantially with those of Mr. Francis and Mr. Asher in regard to this matter.

The Chair stated that there were a few other papers that the Committee had accepted, which would have to be read by title. One of these was a paper on the "Percentage of Moisture in Commercial Starches," by E. N. Gathercoal, and a very important paper by Frank X. Moerk, of Philadelphia, on the "Classification of the Quantitative Statements of the U. S. P., Eighth Revision." He said he was sorry there was not time to go into this matter in detail, as the article had been very carefully prepared, and really accomplished the things which Chairman Coblenz, in his address, thought it would be very difficult to accomplish, viz.; arranging the quantitative tests of the Pharmacopœia in such a manner as to throw them into classes. He said the members would await the publication of this paper with great interest. Also, he said there were two very valuable papers by A. B. Lyons, one on "Liquor Potassii Arsenitis," in which he makes experiments showing the rate at which this preparation oxidizes; the other paper entitled "Alcohol Table," to facilitate rapid approximate determinations of alcohol by apparent specific gravity. He called attention to the enormous amount of labor Mr. Lyons had gone to in the preparation of this latter paper, and explained his method. The full text of said papers here follows, in the order given.

#### THE PERCENTAGE OF MOISTURE IN COMMERCIAL STARCHES.

BY E. N. GATHERCOAL.

During the recent examination of a number of laundry starches it was noted that their percentage of moisture was invariably lower than the amount usually stated as present in starch. This led to the examination of a number of commercial food-starches and flours for their water content and an interesting series of results was presented.

Quotations from several authors follow:

Frankel-Hutten—Starch, Glucose and Dextrine. "In a perfectly air-dry state starch contains 18 per cent. or four equivalents of water, of which, however, two equivalents or one-half will evaporate in a vacuum over sulphuric acid."

"The amount of water contained in starch is very varying. In its green state, that is, when freshly prepared and left to lie on a water-absorbing surface (for instance gypsum plate) for from twenty-four to thirty-six hours, starch will contain approximately 45.5 per cent. of water, of which nothing can be further removed by pressing. When regularly dried and then exposed to a damp atmosphere of 20° C. (68° F.) for several days, it will contain an average of 35.75 per cent. of water. Stored in a dry magazine its contents of moisture amount to 18 per cent. Totally dried at a temperature of 100° C. (212° F.) in a space void of air it contains finally no trace of moisture."

Allen's Commercial Organic Analysis—"Ordinary air-dry starch contains about 18 per cent. of water, a proportion corresponding to the formula  $C_6H_{10}O_5 + 2H_2O$ . When dried in vacuum the product contains  $C_6H_{10}O_5 + H_2O$  and by heating to 100° to 110° in a current of dry air anhydrous starch is obtained as a highly hygroscopic powder."

Wiley—Foods and Their Adulterations. "The average moisture in Indian corn flour is 12.5 per cent., and in wheat flour 12 per cent. The United States standard for flour permits not more than 13.5 per cent. of moisture.

The United States Pharmacopœia and the U. S. Dispensatory make no mention of the water in starch.

The method of procedure employed to determine the amount of moisture was as follows: The starch was placed over sulphuric acid for eighteen hours, in the water oven at 60° C. three hours, then raised to about 100° C. three hours, and in the hot air oven at 110° C. to 120° C. three hours.

The results of the examination of thirty-five starches and flours are as follows:

Yellow corn meal.....	11.9	per cent.
Kingford's corn starch (food) .....	10.2	"
Commercial wheat flour .....	11.85	"
Commercial wheat flour .....	12.15	"
Commercial rice flour .....	9.4	"
Taylor's arrowroot starch.....	10.1	"
Commercial potato starch.....	12.2	"
Homemade potato starch.....	9.88	"
(Dried over moderately heated steam radiator.)		

Sample No. 3. Wheat laundry starch ...	8.42	per cent.
Sample No. 4. Wheat laundry starch .....	8.24	"
Sample No. * 1. Wheat laundry starch .....	10.80	"
Sample No. * 58. Wheat laundry starch .....	10.81	"
Sample No. * 5. Wheat laundry starch .....	10.63	"
Sample No. * 8. Wheat laundry starch .....	10.47	"

\* These last four starches were commercial samples obtained from the different jobbers but subsequently were found so be from the same factory.



No. 27. Corn laundry starch .....	12.00 per cent.
No. 28. Corn laundry starch .....	11.20 "
No. 2. Corn, wheat and potato .....	9.40 "
No. 36. Corn laundry starch .....	10.00 "
No. 33. Corn laundry starch .....	7.80 "
No. 35. Corn laundry starch .....	10.00 "
No. 43. Corn laundry starch .....	11.15 "
No. 38. Corn laundry starch .....	9.20 "
No. 41. Corn laundry starch .....	9.80 "
No. 21. Corn and wheat starch .....	12.25 "
No. 31. Corn laundry starch .....	11.10 "
No. 13. Corn laundry starch .....	10.20 "
No. 53. Corn laundry starch .....	10.95 "
No. 55. Corn laundry starch .....	12.10 "
No. 51. Corn laundry starch .....	11.25 "
No. 57. Corn laundry starch .....	11.21 "
No. 56. Corn laundry starch .....	10.00 "
No. 10. Corn and wheat starch .....	10.12 "
No. 15. Corn laundry starch .....	8.15 "
No. 52. Corn laundry starch .....	10.41 "
No. 54. Corn laundry starch .....	9.61 "

Further experiments and moisture determinations were made as follows : A freshly prepared potato starch and wheat and corn starches which had been mixed with cold water and drained on filters, contained approximately, 65 per cent. of water. The three samples were then kept on frequently changed filters to absorb as much of the water as possible at 20° C., and contained potato, 51.40 per cent. of water ; corn, 48.4 per cent. ; and wheat, 44.0 per cent.

Each of the starches was now divided into three portions. The first portion was dried in thin layers on filters at the room temperature of 27° C. to 30° C. for 24 hours, the air being quite dry, and then yielded : potato, 9.88 per cent. ; corn, 7.08 per cent. ; and wheat, 7.11 per cent. of moisture.

The second portions were dried over the steam radiator for twelve hours, the temperature the last six hours being 50° C., and then contained : potato, 6.8 per cent. ; corn, 4.45 per cent. ; and wheat, 3.82 per cent. of water.

The third portions were dried at 60° C. in the oven for two hours ; then yielding potato, 19 per cent. ; corn, 16.25 per cent. ; and wheat, 8.2 per cent. of moisture.

Several samples of the above starches, after being completely dried, were exposed for twenty-four hours at the room temperature, 20° C., and absorbed potato, 10.4 per cent. ; corn, 10.52 per cent. ; and wheat, 10.00 per cent. of water. A further exposure to a cool moist atmosphere for twenty-four hours increased the moisture in potato to 16.23 per cent. ; corn, 14.25 per cent. ; and wheat, 15.25 per cent.

Fourteen starches, after being completely dried, were exposed to room temperature,  $20^{\circ}\text{C}$ ., the air being steamheated and dry, for from one to three days, and very uniformly absorbed from 7 to 8 per cent. of moisture.

The manufacturers of starch employ a gradually increased heat in their dry rooms of  $25^{\circ}$  to  $100^{\circ}\text{C}$ ., after extracting the moisture from the starch as completely as possible by centrifuging.

In summary, these results show that the percentage of water in artificially dried starch depends on two factors, the length of time and height of temperature employed in the process of drying and the condition of the atmosphere as to moisture in which the starch is subsequently kept. Apparently of commercial starches in Chicago few exceed 12 per cent. of moisture, the average being about 10 per cent.

It would be of interest to know how atmospheric conditions in various parts of the world affect starches and whether, perhaps, this factor does not account for the variations between the results above given and the statements from the English authors above quoted.

*University of Illinois School of Pharmacy, Chicago, Illinois.*

CLASSIFICATION OF THE QUANTITATIVE STATEMENTS OF THE U. S. P.,  
(8TH REVISION.)

BY FRANK X. MOERK.

As the time is approaching for the next meeting of the U. S. P. convention and as no doubt preliminary work is already under way for the revision, the following paper upon the quantitative tests of the 8th revision is timely.

The 8th revision contains some marked departures from previous editions, notably in the effort to keep down the size of the book by needless repetitions; this is especially shown in the time-limit test for heavy metals, the acidity and saponification figures, the alkaloidal assay processes and in some of the determinations made in volatile oils.

The same plan can be advantageously followed in any of the other determinations and in this way obviate the small difference in the methods of the analysis of chemicals and preparations which are so abundantly found in the present edition and which are, no doubt, due to the assignment of the work to different members of the committee and accepting the individual method without reference to methods used by others in similar cases.

The following classification of official quantitative statements excepts only solubilities, specific gravities and melting, boiling and congealing points. In view of the fact that U. S. P. is recognized as the standard in the enforcement of the National Food and Drugs Law, an official method for these determinations should be given corresponding to the directions for determining the optical rotation of organic substances.

The classification is followed by some comments or suggestions intended to assist in harmonizing the methods or the expression of results for similar substances.

## GRAVIMETRIC DETERMINATIONS.

## I. Volatile matter determined :

*A.* Moisture in drugs, expressed as percentage by weight : aloes ; musk ; soap ; purified talc.

*B.* Water of crystallization :

*a.* Expressed as percentage by weight.

Cinchonine sulphate.

*b.* Expressed as molecules of  $H_2O$  lost.

Cinchonidine sulphate ; codeine ; codeine phosphate ; codeine sulphate ;  $CuSO_4 \cdot 5H_2O$  (at  $100^\circ C.$ ) ;  $MgSO_4 \cdot 7H_2O$  ; morphine ; morphine hydrochloride ; morphine sulphate ; quinine sulphate (at  $60^\circ C.$ ) ;  $Na\bar{A} \cdot 3H_2O$  ;  $Na_2HAsO_4 \cdot 7H_2O$  ;  $(Na_3\bar{C})_{2.11}H_2O$  ; zinc sulphocarbonate ;  $ZnSO_4 \cdot 7H_2O$ .

*c.* Expressed as percentage by weight and molecules  $H_2O$  lost.

Alum ; aluminum sulphate ;  $(KSbOT)_2 \cdot H_2O$  ;  $CuSO_4 \cdot 5H_2O$  ;  $Pb\bar{A}_2 \cdot 3H_2O$  ;  $K_2C \cdot H_2O$  ; quinine ; quinine bisulphate ; quinine hydrobromide ; quinine hydrochloride ; quinine salicylate ;  $Na_2B_4O_7 \cdot 10H_2O$  ;  $Na_2CO_3 \cdot H_2O$  ; sodium sulphocarbonate :  $Na_2HPO_4 \cdot 12H_2O$  ;  $Na_4P_2O_7 \cdot 10H_2O$  ;  $Na_2SO_4 \cdot 10H_2O$  ;  $Na_2SO_3 \cdot 7H_2O$  ;  $Na_2S_2O_3 \cdot 5H_2O$  ; sparteine sulphate ; strychnine sulphate.

*d.* Expressed in actual weights.

$MnSO_4 \cdot 4H_2O$ .

*C.* Loss due to  $H_2O + CO_2$  ; expressed as percentage by weight.

$PbO$  ;  $NaHCO_3$ .

*D.* Alcohol determinations : Expressed as percentage by weight and by volume.

Red wine ; white wine.

## II. Residual matter determined :

*A.* Direct evaporation or ignition.

*a.* Total solids in volatile liquids :

1. Expressed as percentage by weight.

Red wine ; white wine ; dilute  $HCl$ .

2. Expressed in actual weights.

Whisky ; brandy ;  $H_2O$  ; distilled  $H_2O$  ;  $H_2O_2$ .

*b.* Non-volatile mineral matter in organic compounds :

1. Expressed as percentage by weight.

$H_3\bar{C} \cdot H_2O$  ;  $HSal$  ;  $HTan$  ;  $H_2T$  ; starch ; gelatin ; purified cotton ;  $CHI_3$  ; iodol ; Sol.  $CH_2O$  ; resin of podophyllum ; resin of scammony ; sugar of milk.

2. Expressed in actual weights.

$HLact.$  ; methylene blue ; thymol iodide.

*c.* Non-volatile mineral matter in volatile or combustible inorganic substances.

Expressed as percentage by weight.

Animal charcoal ; purified animal charcoal ;  $\text{Hg}_2\text{I}_2$  ;  $\text{HgI}_2$  ;  $\text{HgO}$  (yellow) ; washed sulphur ; sublimed sulphur.

d. Salts of metals decomposed by ignition :

1. Expressed as percentage by weight.

$\text{AgCN}$  ; magnesium carbonate ;  $\text{KClO}_3$  ;  $\text{NaClO}_3$  ; sodium sulphocarbolate ; zinc carbonate ; zinc sulphocarbolate.

2. Expressed in actual weights.

$\text{Ag}_2\text{O}$  ; bismuth subcarbonate ; bismuth subnitrate.

e. Ash in drugs : Expressed as percentage by weight.

Acacia ; asafetida ; benzoin ; gamboge ; cantharides ; cardamom ; caraway ; cloves ; Ceylon cinnamon ; cochineal ; gambir ; desiccated suprarenal glands ; desiccated thyroid glands ; guaiac ; lupulin ; lycopodium ; honey ; musk ; pepper ; scammony ; kaolin.

B. Ignition, preceded by or followed by some treatment before weighing residue : Expressed in actual weights.

a. Addition of  $\text{HNO}_3$  to prevent volatility of impurity,  $\text{NH}_4\text{Cl}$ .

b. Ignition followed by  $\text{HNO}_3$  and re-ignition.

Bismuth citrate ; bismuth and ammonium citrate ; bismuth subgallate ; bismuth subsalicylate (sample dried at  $120^\circ \text{C}$ .)

c. Ignition followed by  $\text{HNO}_3 + \text{H}_2\text{SO}_4$  and re-ignition.

Lithium citrate (sample dried at  $150^\circ \text{C}$ .)

d. Addition of  $\text{H}_2\text{SO}_4$  ignition, moistening with  $\text{H}_2\text{SO}_4$  and re-ignition, strontium salicylate.

e. Addition of  $(\text{NH}_4)_2\text{SO}_4$  and ignition.

Lithium benzoate, lithium salicylate.

f. Ash determination, after evaporation and ignition, moistened with  $(\text{NH}_4)_2\text{CO}_3$  and re-ignited.

Red wine ; white wine.

### III. Special methods :

A. Exact quantitative determinations ; results expressed in actual weights :

a. Au in gold and sodium chloride.

b. Hg in mercurial ointment.

c. ZnO in

1.  $\text{ZnCl}_2$ .

2. Zinc stearate.

d. Cinnamein content of balsam of Peru.

e. Resin content of jalap.

B. Minimum percentage content to conform to U. S. P. standard, sulphurated lime.

C. Limit of chloride :  $\text{ZnI}_2$ .

IV. Alkaloidal assays: in solids expressed as percentage by weight, in liquids as weight in 100 Cc.

*A.* Alkaloid precipitated and weighed:

Opium, powdered opium, extract of opium, deodorized opium, granulated opium, tincture of opium, tincture of deodorized opium.

*B.* Alkaloid extracted by immiscible solvent and weighed:

*a.* By  $\text{CHCl}_3$ : Cinchona (total alkaloids), iron and quinine citrate, soluble iron and quinine citrate, iron and strychnine citrate, codeine phosphate, colchicum corm., extract of colchicum, colchicum seed, fluidextract of colchicum, tincture of colchicum, guarana, fluidextract of guarana.

*b.* By ether: Cinchona (ether-soluble alkaloids), hydrastis, fluidextract of hydrastis, tincture of hydrastis.

*C.* Alkaloid extracted by immiscible solvent (ether), and weighed as hydrochloride, conium, fluidextract of conium.

V. Assay of digestive ferments:

*A.* Hydrolysis of albumen, pepsin.

*B.* Hydrolysis of starch, pancreatin.

VOLUMETRIC DETERMINATIONS.

I. Direct titration. Results expressed in percentage by weight (exception in A, b, aa, 2 and in B, d).

*A.* Weight taken bears simple relation to molecular weight:

*a.* Directed weight titrated, required Cc. of V. S. specified.

*aa.* No preliminary operation required.

Neutralization, Dil.  $\text{H}\bar{\text{A}}$ , Dil.  $\text{HCl}$ , Dil.  $\text{HNO}_3$ , Dil.  $\text{H}_3\text{PO}_4$ , Dil.  $\text{H}_2\text{SO}_4$ ,  $\text{H}_2\bar{\text{T}}$ , Sol.  $\text{KOH}$ , Sol.  $\text{NaOH}$ .

Oxidation, Saccharated  $\text{FeCO}_3$ ,  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ ,  $(\text{FeSO}_4)_2 \cdot 3\text{H}_2\text{O}$ ; solution of potassium arsenite, sol.  $\text{As}_2\text{O}_3$ .

Reduction, comp. sol. iodine, sol. chlorinated soda.

*bb.* Preliminary operations required:

1. Addition of  $\text{KI}$  and  $\text{HCl}$ , and moderate heating:  
Reduction,  $\text{Fe}_2\text{C}_2$ ,  $\text{Fe}_2\text{NH}_4\bar{\text{C}}$ ,  $\text{Fe}(\text{NH}_4)(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$ ,  $\text{Fe}_2(\text{NH}_4)\text{T}$ ,  $\text{Fe}_2(\text{K})\text{T}$ ,  $\text{Fe}_2(\text{PO}_4)_2$  soluble,  $(\text{Fe}_2)_2(\text{P}_2\text{O}_7)_2$  soluble, solution of  $\text{Fe}_2(\text{SO}_4)_3$ .

2. Removal of alcohol and oxidation of ferrous salt, then as preceding:

Reduction, tincture of  $\text{FeCl}_3$ .

*b.* Directed weight diluted with  $\text{H}_2\text{O}$ , aliquot portion taken bears simple relation to molecular weight:

*aa.* No preliminary operation required:

1. Required Cc. of V. S. specified.

Neutralization,  $\text{HA}$ ,  $\text{H}_3\text{C.H}_3\text{O}$ ,  $\text{H}_3\text{P}\bar{\text{O}}_4$ , dil.  $\text{H}_3\text{PO}_4$ , lactic acid,  $\text{H}_3\text{PO}_4$  (addition of  $\text{NaCl}$ ).

Oxidation,  $(\text{KSbOT})_3 \cdot \text{H}_2\text{O}$ .

Precipitation,  $\text{HCN} (+\text{NH}_3 + \text{KI})$ ;  $\text{KCN} (+\text{NH}_3 + \text{KI})$ .

2. Required Cc. of V. S. not specified.

Reduction,  $\text{H}_2\text{O}_2$  (original quantity measured).

*bb.* Preliminary operation required; required Cc. of V. S. specified.

1. Addition of KI and HCl, and moderate heating.

Reduction, Sol.  $\text{FeCl}_3$ , sol.  $(\text{Fe}_2)_2\text{O}(\text{SO}_4)_2$ ,  $\text{CrO}_3$  (cold).

2. Dried (?) prior to weighing, then as preceding.

Reduction,  $\text{FeCl}_3$ .

3. Alkaloids first extracted, then as preceding.

Reduction,  $\text{Fe}_2 + \text{Quin.C}$ ,  $\text{Fe}_2 + \text{Quin.}\bar{\text{C}}$  soluble,  $\text{Fe}_2 + \text{strych. } \bar{\text{C}}$ .

4. Carefully neutralized before diluting:

Precipitation, dil.  $\text{HBr}$ .

*B.* Weight taken bears no simple relation to molecular weight.

*a.* Directed weight titrated:

*aa.* No preliminary operation required.

1. Required Cc. of V. S. specified.

Neutralization,  $\text{H}_3\text{BO}_3 (+\text{glycerin})$ ,  $\text{HC}_2\text{Cl}_3\text{O}_2$ ,  $\text{KHCO}_3$ ,  $\text{NaHCO}_3$ ,  $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$ .

Precipitation,  $\text{SrBr}_2 \cdot 6\text{H}_2\text{O}$ , oil of bitter almond ( $\text{HCN} (+\text{Mg}(\text{OH})_2)$ ).

Oxidation,  $\text{AsI}_3$ ,  $\text{As}_2\text{O}_3$ ,  $\text{Na}_2\text{S}_2\text{O}_5 \cdot 5\text{H}_2\text{O}$ .

Reduction,  $\text{S}_2\text{I}_2(\text{I})$ .

2. Required Cc. of V. S. not specified.

Neutralization,  $\text{KOH}$ ,  $\text{NaOH}$ .

Reduction, iodine.

*bb.* Preliminary operation required, dried prior to weighing, required Cc. of V. S. specified.

Neutralization  $\text{K}_2\text{CO}_3$  ( $130^\circ \text{C.}$ ),  $\text{Na}_2\text{CO}_3$  ( $100^\circ \text{C.}$ ).

Precipitation,  $\text{KBr} (?)$ ,  $\text{KI} (?)$ ,  $\text{NaBr} (?)$ ,  $\text{NaI} (?)$ ,  $\text{ZnBr}_2 (?)$ .

*b.* Directed weight diluted with  $\text{H}_2\text{O}$ , aliquot portion taken.

*aa.* No preliminary operation required.

1. Required Cc. of V. S. specified.

Precipitation,  $\text{NH}_4\text{Br}$ .

2. Required Cc. of V. S. not specified.

Reduction,  $\text{CaOCl}_2 (+\text{KI} + \text{HCl})$ .

*bb.* Preliminary operation required, required Cc. of V. S. specified.

1. Dried prior to weighing.

Precipitation,  $\text{LiBr}$ ,  $\text{NaCl}$ .

2. Ignition (to change organic salts of K and Na into carbonates).

Neutralization,  $K\bar{A}$ ,  $KHT$ ,  $K_3C.H_2O$ , sol.  $K_3\bar{C}$ ,  $KNaT.4H_2O$ ,  $NaA.3H_2O$ ,  $NaBenz$ ,  $(Na_3\bar{C})_{1.11}H_2O$ ,  $NaSal$ .

- c. Substance measured, then weighed, required Cc. of V. S. not specified.

aa. No preliminary operation required.

Neutralization, Glacial  $HA$ ,  $HCl$ ,  $HNO_3$ ,  $H_2SO_4$ ,  $NH_3$  Water, stronger  $NH_3$  Water, spirit  $NH_3$ .

bb. Preliminary operation required, treatment with  $Na_2SO_3$ , liberates  $NaOH$ .

Neutralization:  $C_7H_6O$ ,  $C_9H_8O$ , oil of bitter almond ( $C_7H_6O$ ), oil of lemon (citral,  $C_{10}H_{16}O$ ).

- d. Substance measured; required Cc. of V. S. specified:

Neutralization, Sol.  $Ca(OH)_2$ ; lemon juice.

Reduction, tincture of iodine.

## II. Residual titrations. Results expressed as percentage by weight (exceptions in case of fluidextracts and tinctures in B, a, bb, 3).

### A. Weight taken bears simple relation to molecular weight.

- a. Directed weight titrated; required Cc. of V. S. specified.

aa. No preliminary operation required.

Precipitation, Dil.  $HI$ .

bb. Preliminary operation required; ignition prior to weighing; neutralization,  $MgCO_3(MgO)$ ,  $MgO$ .

- b. Directed weight diluted with  $H_2O$ ; aliquot portion bears simple relation to molecular weight; required Cc. of V. S. specified.

aa. No preliminary operation required.

Precipitation, syrup  $HI$ , syrup  $FeI_2$ .

bb. Preliminary operation required:

1. Boiled for four hours before final dilution.

Neutralization, aromatic  $H_2SO_4$ .

2. Addition of excess of  $Br$ , later of  $KI$  and  $CHCl_3$ .

Precipitation and reduction,  $C_6H_5OH$ .

3. Addition of excess  $H_2C_2O_4$  before final dilution.

Precipitation and oxidation, sol. lead subacetate.

4. Addition of excess of  $I$  and  $KI$  before final dilution; required Cc. of V. S. not specified.

Oxidation and reduction, reduced iron.

### B. Weight taken bears no simple relation to molecular weight.

- a. Directed weight titrated.

aa. No preliminary operation required.

1. Required Cc. of V. S. specified:

Neutralization, ammonium carbonate,  $Li_2CO_3$ .

Precipitation,  $\text{AgNO}_3$  (all forms),  $\text{SrI}_2 \cdot 6\text{H}_2\text{O}$ .

Oxidation,  $\text{NaHSO}_3$ ,  $\text{Na}_2\text{SO}_3 \cdot 7\text{H}_2\text{O}$ .

Reduction,  $\text{MnO}_2$ ,  $\text{K}_2\text{Mn}_2\text{O}_8$ .

2. Required Cc. of V. S. not specified.

Oxidation,  $\text{H}_2\text{SO}_5(\text{SO}_3)$ .

bb. Preliminary operations required :

1. Dried prior to weighing ; required Cc. of V. S. specified.

Precipitation,  $\text{ZnI}_2$ .

2. Ignition prior to weighing ; required Cc. of V. S. specified. Neutralization,  $\text{ZnO}$ .

3. Extraction of alkaloids ; required Cc. of V. S. given in tables pp. 569-575 U. S. P.

Neutralization :

*Aconite*, root, fluidextract, tincture.

*Belladonna*, root, fluidextract.

*Belladonna*, leaves, extract, plaster, tincture.

*Coca*, leaves, fluidextract.

*Hyoscyamus*, leaves, extract, fluidextract, tincture.

*Ipecac*, root, fluidextract.

*Nux Vomica*, seed, extract, fluidextract, tincture.

*Physostigma*, seed, extract, tincture.

*Pilocarpus*, leaves, fluidextract.

*Scopola*, root, fluidextract, extract.

*Stramonium*, leaves, extract, fluidextract, tincture.

4. Iodine absorption ; results in per cent. of I taken up under prescribed conditions, required Cc. of V. S. not specified, oxidation (addition). *Oils* : lard, expressed almond, cottonseed, linseed, cod-liver, olive, castor, croton, theobroma.

b. Directed weight diluted with  $\text{H}_2\text{O}$  ; aliquot portion taken bears no simple relation to molecular weight, required Cc. of V. S. specified.

Oxidation,  $\text{NaNO}_2$ .

c. Substance measured, then weighed ; require preliminary operation.

aa. Required Cc. of V. S. specified.

Union with  $\text{NH}_3$  ; precipitation. Volatile oil of mustard.

bb. Required Cc. of V. S. not specified.

1. Oxidation of aldehyde to acid.

Neutralization, sol.  $\text{CH}_3\text{O}$ .

2. Saponification of esters, direct.

Neutralization, oils of peppermint and rosemary.

3. Saponification of acetylated alcohols.

Neutralization, oils of peppermint, rosemary and santal.



## III. Results expressed in volume percentage.

*A.* Important constituent removed (dissolved) by suitable reagent, leaving insoluble portion to be measured :

- a.* Phenols dissolved by alkali solution.  
Oils of cloves, pimenta and thyme.
- b.* Aldehydes dissolved by  $\text{NaHSO}_3$  sol.  
Oils of cinnamon and cassia.
- c.* Terpenes dissolved by conc.  $\text{H}_2\text{SO}_4$ .  
Oil of turpentine.

*B.* Important constituent removed (precipitated), washed, liberated and measured :

Cineol assays, oils of cajuput and eucalyptus.

*C.* Impurity removed by suitable solvent and its content noted by the decrease in volume :

- a.* Test for alcohol by shaking with  $\text{H}_2\text{O}$  : Oils of anise and lavender, ether.
- b.* Test for alcohol by shaking with  $\text{H}_2\text{O}$  : saturated with substance to be treated, acetic ether.

## IV. Results expressed in terms of milligrammes of KOH neutralized by 1 Gm. of substance.

*A.* Direct titration (acidity figure), guaiac, mastic, rosin.

*B.* Residual titration (saponification figure). Oils : Lard, expressed almond, cottonseed, linseed, cod-liver, olive castor, croton, theobroma, rose. Wax, yellow.

V. Maximum and minimum limits to show conformity to official standard of purity, results expressed in no. of Cc. of stated V. S. (exceptions in *A*, *a*, *aa* 2 and *A*, *b*, *aa*.).

*A.* Direct titrations.

*a.* Substance weighed :

*aa.* Neutralization.

- 1. Alkalinity determined, KBr, KI, NaBr, NaI,— $\text{KH}_2\text{PO}_4$ ,  $\text{NaH}_2\text{PO}_4$  (well dried (?),  $\text{NaHCO}_3$ , zinc carbonate, soap, soft soap.
- 2. Acidity determined,  $\text{Ca}(\text{H}_2\text{PO}_4)_2$ , lard, wool fat, balsam of Peru, balsam of tolu, copaiba, malt (as per cent. lactic acid), resin of jalap.

*bb.* Precipitation, tests for chlorides, bromides, thiosulphates,  $\text{NH}_4\text{I}$  (dried at  $100^\circ\text{C}$ .), KI, NaI.

*b.* Substance measured.

*aa.* Neutralization, acidity determined,  $\text{C}_6\text{H}_{11}\text{NO}$ , paraldehyde, whisky, brandy, red wine, white wine, sol.  $\text{CH}_2\text{O}$  (as per cent.  $\text{CHO}_2$ ).

*bb.* Oxidation, oxidizable matter determined, acetone,  $\text{HC}_2\text{H}_3\text{O}_2$ , glacial,  $\text{HC}_2\text{H}_5\text{O}_2$ ,  $\text{NH}_3$  water,  $\text{H}_2\text{O}$ , distilled  $\text{H}_2\text{O}$ .

*B. Residual titrations.**a. Substance weighed.*

*aa.* Neutralization, saponifiable matter determined, balsam of Peru (cinnaein), balsam of tolu, resin of jalap.

*b. Substance measured.*

*aa.* Neutralization, acidity determined,  $H_2O_2$ .

## GASOMETRIC DETERMINATIONS.

Evolution of NO :  $C_5H_{11}NO_2$ , spirit of  $C_2H_5NO_2$ .

## COMMENTS.

*Gravimetric Determinations* : The first point to note is that two methods of expressing results are used : percentage and actual weight.

Frequently chemicals are directed to be dried preparatory to the analysis, but generally the temperature conditions are omitted.

*Loss of Water of Crystallization* : The results are stated differently. (1) actual loss in weight ; (2) loss in percentage ; (3) loss in number of molecules of  $H_2O$  ; (4) combinations of the preceding.

*Residue upon Ignition* : An ash determination should be described, as no definite directions are anywhere given, although it frequently makes considerable difference if the determination be made in platinum or in porcelain ; the usual treatment of the ash with ammonium carbonate to re-convert alkaline-earth oxides into carbonates is only given under red and white wines.

*Alkaloidal Assays* : Extract of opium is assayed by a process in which all quantities are changed from those used for opium and its other preparations ; by using 6 Gm. of extract instead of 4 Gm. the usual directions could be followed.

In the cinchona assay processes the alkaloids are dried at  $110^\circ C.$ , and the strength is stated in terms of anhydrous alkaloids, while under quinine the statement is made that it becomes anhydrous at  $125^\circ C.$

*Starch* : Should show not less than 95 per cent. hydrolizable carbohydrate ; no process given.

*Lithium Salts* : Tested for other alkalies by solubility of the chloride in amyl alcohol ; no directions given to wash the insoluble matter prior to weighing.

*Volumetric Determinations* : A distinct advance is scored by permitting the use of empirical volumetric solutions (p. 546). This may be the entering wedge to subsequent statements giving the molecular ratio between the substance to be estimated and the active constituent of the volumetric solution, or, instead of this, a list of factors by which the weight of the substance desired can be obtained from the weight of active reagent used ; in residual titrations we may also expect statements to show when an excess of the first volumetric solution has been added.

Many cases are noted in which volumes of solutions (either chemicals or reagents) are directed to be used which are almost impossible, under ordinary conditions, to measure accurately, notwithstanding the explanatory help given page 545. Frequently there appear two sets of figures, the first of which must appear approximate, while the last (placed in parentheses) is more accurate, and is necessary to realize the percentage requirement stated in the text. Illustrations of this: Dil. HBr; (KSbOT)<sub>3</sub> H<sub>2</sub>O; Sol. KOH; (Na<sub>2</sub>C)<sub>2</sub>.11H<sub>2</sub>O; NaSal, etc., etc.

Of dil. HNO<sub>3</sub>, 6.257 Gm.; of tincture of FeCl<sub>3</sub>, 2.22 Gm., etc., etc., are directed to be weighed for assay; would it not be better, less trouble and more accurate to direct an approximate volume and then accurately weigh, as is done in the case of strong acids, NH<sub>3</sub>, benzaldehyde, etc., etc.?

Often directions are given to dry, or even ignite, chemicals before weighing them for analysis, in the former case generally without specifying the temperature, using instead such terms as dried, well dried and anhydrous; it seems to me the object of these assays is to determine the purity of the substances as they are likely to be dispensed, and surely no one would go to this trouble if not forced to do so.

Fe(NH<sub>4</sub>)(SO<sub>4</sub>).12H<sub>2</sub>O: 11.5 per cent. metallic iron is equivalent to 99.188 per cent. of the pure crystallized salt, and not 99.5 per cent., as stated in the text.

*Trichloroacetic Acid and Sulphur Iodide*: No percentage requirement given in the text, but from the Cc. of volumetric solution used the former should contain not less than 98.89 per cent. (table, p. 569, gives 98.9 per cent.), the latter should contain not less than 70.5 per cent. iodine (table, p. 574, gives about 80 per cent.).

*Haloid Salts*: NaI, NaBr, KBr and KI are weighed and taken for the titration; in NH<sub>4</sub>Br and NaCl the directed weight is diluted and an aliquot portion taken. Why not have uniformity? The weighing of 0.1 Gm. NaCl, for instance, should not be more difficult than the weighing of 0.1 Gm. As<sub>2</sub>O<sub>3</sub> or K<sub>2</sub>Mn<sub>2</sub>O<sub>8</sub>. (See Note.)

*Organic Salts of K and Na*: The directions for these are misleading when they state that washing should be continued until the washings no longer react with methyl orange indicator, water and alkaline carbonates producing the same color. What is intended is to titrate the first washings and then add subsequent washings to the titrated solution, then adding more V. S. if necessary, until the final washings no longer cause change of color in the titrated solution. This indicator is only valuable in cold solutions.

HCl V. S. is used for K<sub>2</sub>C, KNaT and NaA, while in all other cases H<sub>2</sub>SO<sub>4</sub> V. S. is directed. The strength of sol. K<sub>2</sub>C is expressed in terms of anhydrous salt instead of the official salt, K<sub>2</sub>C.H<sub>2</sub>O.

*Syrup HI and Syrup FeI<sub>2</sub>*: Theoretically the assay of these should be identical, but the U. S. P. directs in the former to weigh 31.73 (31.725)

Gm., dilute to 50 Cc., and use 10 Cc.; in the latter 10 Gm. are diluted to 100 Cc., and of this, 15.4 (15.36) Cc. taken.  $\text{H}_2\text{PO}_2$  interferes in these assays by giving a black precipitate of metallic silver.

In these residual titrations (Volhard's method) the precipitated silver salt should be filtered out and washed, and the filtrate and washings titrated with KCNS; in this way the interaction between the precipitated silver salt and the  $\text{Fe}(\text{CNS})_3$  is prevented, and the end reaction remains permanent.

*Oil of Lemon*: The factor for citral is given as 0.03802, obviously based upon  $\text{O} = 16$ ; it should be 0.037745 ( $\text{H} = 1$ ).

*Acidity Figures*: These are given under guaiac, mastic and rosin; similar determinations are made under balsam of Peru, balsam of tolu, copaiba, wool fat, lard and resin of jalap, but here expressed in terms of Cc. V. S.

*Saponification Figures*: Instead of giving limit of saponifiable matter in balsam of Peru, balsam of tolu and resin of jalap in terms of Cc. V. S., the results could be expressed as saponification figures.

*Alkaloidal Assays*: In these the quantity of V. S. is only given in the tables, pp. 569-575; in the recent corrections of the U. S. P. the percentages were changed in these tables, but in no instance was a change made in the number of Cc. of the V. S. to conform to the new percentage strength.

*Ext. Nux Vomica*: In this assay the extract is dissolved in ether, chloroform and ammonia and the beaker directed to be rinsed with a little chloroform; it does not take much additional chloroform to change the original light ether-chloroform mixture into a heavy one, which would nullify the balance of the assay. It would be better to rinse the beaker with an ether-chloroform mixture, using the proportions first given.

*$\text{NaNO}_2$* : Titration of  $\text{K}_2\text{Mn}_2\text{O}_8$  with oxalic acid is slow and therefore liable to give erroneous results; for this reason the assay of  $\text{K}_2\text{Mn}_2\text{O}_8$  has been changed from a direct to a residual titration. The same reasons apply to  $\text{NaNO}_2$ ; add excess of  $\text{K}_2\text{Mn}_2\text{O}_8$  V. S. to oxidize  $\text{NaNO}_2$  to  $\text{NaNO}_3$ , then add excess  $\text{H}_2\text{C}_2\text{O}_4$  V. S. to reduce excess of  $\text{K}_2\text{Mn}_2\text{O}_8$  and lastly titrate excess of  $\text{H}_2\text{C}_2\text{O}_4$  V. S. with  $\text{K}_2\text{Mn}_2\text{O}_8$  V. S.

*Volatile Oil of Mustard*: From Cc. of V. S. consumed in the assay 92.49 per cent. allyl thioisocyanate are indicated and not 92 per cent. as stated in text.

*Volatile Oils*: The determination of phenols and aldehydes in this class, also oil of turpentine as given in the U. S. P. by agitation with suitable reagents and reading off in a burette the undissolved volume is neither speedy nor very accurate. Very good results have been obtained by using a centrifuge and graduated bottles as used for milk analysis. The cost of such an outfit is inexpensive in comparison with a polariscope, the working of which is described in the U. S. P.

NOTE.—*Addition to paragraph on Haloid Salts:* Limit tests for chlorides, bromides (and thiosulphates) in haloid salts: While in KI and NaI a very decided excess of  $\text{AgNO}_3$  is added, in  $\text{NH}_4\text{I}$  the  $\text{AgNO}_3$  is barely sufficient to react with a 97 per cent. pure  $\text{NH}_4\text{I}$  and there is practically no  $\text{AgNO}_3$  to react with 3 per cent. chloride and bromide which this test is supposed to indicate in the  $\text{NH}_4\text{I}$ .

These comments could be considerably lengthened, but they would then become repetitions. As the U. S. P. has systematically arranged its preparations so that there is something common to each class, let it proceed in the same manner with its assays, bringing together those which naturally form a group and for which the same directions will apply. The classification certainly shows the necessity for such work. The start has been made, let it continue for the benefit of those who must use the book.

#### NOTES ON LIQUOR POTASSII ARSENITIS.

BY A. B. LYONS, M. D.

Among the official preparations most frequently complained of as not fulfilling U. S. P. requirements is Fowler's solution of arsenic—liquor potassii arsenitis. The "strength" of the solution is determined according to the official test by the quantity of iodine required to oxidize the arsenic, potassium arsenite being converted into potassium arsenate.

The test itself is not well suited to the requirements of the ordinary pharmacist, since a volumetric solution of iodine cannot be depended on to preserve its titer for any length of time, so that either a fresh volumetric solution must be prepared every time a test is made, or else the strength of the solution on hand must be determined, and the result of the titration figured out accordingly. This would not be a very difficult matter were it not that the solution of sodium thiosulphate by which the iodine solution is standardized is also subject to deterioration with age, so that it becomes necessary to ascertain the titer of this solution also. This is done by means of a volumetric solution of potassium dichromate. This last solution is stable, and since arsenites are oxidized by potassium dichromate as well as by iodine, this suggests an alternative procedure for testing Fowler's Solution. To 20 Cc. of the volumetric solution contained in a 500-Cc. flask add 10 Cc. of diluted sulphuric acid and 8 Cc. of the Fowler's Solution. After five minutes add 1 Gm. of pure potassium iodide, cover the flask with a watch glass and let it stand five minutes. Then add 200 Cc. of distilled water and titrate the liberated iodine with volumetric solution of sodium thiosulphate, using starch as indicator. It should require not more than 3.4 Cc. of the thiosulphate solution to discharge the deep blue color of the solution, which will change to a pale green. If the thiosulphate solution is not freshly made, its exact titer must be ascertained by carrying through a parallel experiment exactly as described on page 563 of the U. S. Pharmacopœia.

The details of the test may of course be modified so as to give a result showing the exact percentage of arsenic trioxide potentially present in the solution tested. This could be done by using, instead of 8 Cc., 8.2 Gm. of the Fowler's Solution. Then, if the amount of thiosulphate solution (corrected if necessary to standard strength) required to take up the excess of free iodine, be deducted from 20, the remainder multiplied by six will give the required per cent. Thus if 4.5 Cc. of the thiosulphate solution were consumed in the titration, and it was found that 20.75 Cc. of this solution was the equivalent of 20 Cc. of a true decinormal solution, we should have for the corrected figure instead of 4.5 Cc. above, 4.338, deduced from the proportion  $20.75 : 20.00 :: 4.5 : 4.338$ . Deduct 4.338 from 20, and multiply the remainder by six, and the product, 93.97, represents the required percentage.

There is no statement in the U. S. Pharmacopœia intimating that a solution of potassium arsenite is unstable, or that any precaution should be observed to prevent change in it. There is, however, in the U. S. Dispensatory a statement made on the authority of Dr. R. Fresenius, that solutions of alkaline arsenites absorb oxygen from the air, the arsenite becoming partially converted into arsenate. Hence, it is advised that such solutions should be kept in small bottles filled quite to the neck. The statement had escaped my attention, so that it was a surprise to me to find recently that a one per cent. solution of arsenic trioxide as potassium arsenite, which I had prepared with considerable care, when tested sixteen months afterward contained only about two-thirds of one per cent. of the trioxide. The solution contained a considerable excess of sodium bicarbonate, but it had been kept in a full bottle, closed with a sound cork. The same change must take place in Fowler's Solution, particularly when allowed to remain in a bottle but partially full. The inference was verified by an examination of some old samples of Fowler's Solution, which, although known to have been originally of standard strength, were all found to be below U. S. P. requirements.

This led me to investigate the character of the Fowler's Solution dispensed in Detroit. Eleven samples of the preparation were procured from as many different drug stores—the sale, I noticed, registered in accordance with the State law in only one instance. Each of the samples was tested for arsenate. Magnesia mixture in each case produced a more or less distinct precipitate, appearing slowly in the form of minute crystals. The separation of the precipitate is hastened by vigorous shaking or stirring, and is probably practically complete under such treatment within thirty minutes. If allowed to stand much longer than this, the mixture grows cloudy and deposits a precipitate of a different character, consisting evidently of magnesium arsenite. This, however, disappears on moderate dilution with water, the arsenate remaining undissolved.

Quantitative determination of the arsenate present may be made by

collecting the precipitate on an asbestos filter, drying with due precaution, igniting and weighing. The procedure is tedious, and as my purpose called for only a rough approximation to the truth I resorted to the following short method. I decanted the solution carefully from the crystalline precipitate, washed this once by decantation with distilled water containing ammonia, added a few drops of silver nitrate T. S. and then a drop or two of acetic acid. Red-brown silver arsenate was formed as a somewhat flocculent, yet quickly-subsiding precipitate. The washing had not been complete enough to remove all chloride, so that a little silver chloride was mixed with the silver arsenate. If any silver arsenite had been formed, the excess of acetic acid had dissolved it. Distilled water, about 10 Cc. was added, the precipitate allowed to subside and the fluid decanted upon a small filter. The residue was washed once with 5 Cc. of distilled water, which was also decanted through the filter, and this was finally washed further with a small quantity of distilled water. The fact was borne in mind that silver arsenate is appreciably soluble in distilled water, and somewhat more so in diluted acetic acid. The precipitate remaining in the test tube was dissolved by aid of a drop or two of strong nitric acid and the solution poured upon the filter which had retained a few flakes of silver arsenate. To the filtered solution and washings was added a little ferric ammonium sulphate, and the solution was titrated with potassium sulphocyanate V. S., the result indicating the amount of arsenate present in the sample of Fowler's Solution taken; the quantity so found was of course somewhat below the true figure. It was not in any case very large. The figures appear in the table.

Presence of any considerable quantity of arsenate in Fowler's Solution can be demonstrated by simply adding to the solution a little silver nitrate T. S. and then a few drops of acetic acid. The silver nitrate produces a copious yellow precipitate of silver arsenite. The acetic acid dissolves this promptly, leaving brown silver arsenate if much arsenate is present. In most of the samples examined, the brown precipitate was recognizable, either immediately or after some time. Chloride, which may be looked for if the formula of the U. S. P. has not been strictly followed, will give a white precipitate darkening with light, and may thus interfere with the clear recognition of the silver arsenate. Nitric acid will dissolve the arsenate, leaving behind the chloride, and on neutralizing the filtered solution with ammonia, very cautiously, it may be possible to reproduce the brown precipitate, but it must be remembered that ammonium nitrate (ammonium acetate also) interferes with the reprecipitation. The behavior of acetic acid as a solvent for silver arsenite and silver arsenate seems to be somewhat capricious. The arsenite is certainly much the more soluble, but occasionally acetic acid fails to produce the expected change of color from yellow to red-brown.

Of the eleven samples of Fowler's Solution procured, all but two proved

to be reasonably near to standard strength. Those two, however, fell far below pharmacopœial requirements. They must have been very carelessly made, only about three-fourths of the arsenic trioxide having been brought into solution. There would be no reason for being stingy with the arsenic.

The U. S. P. formula calls for potassium bicarbonate as the alkali to be used in making Fowler's Solution. There have been published from time to time alternative formulas in which potassium hydrate has been substituted for the bicarbonate, solution of the arsenic trioxide being effected thus more quickly. Examination of the eleven samples in hand indicates that this alternative formula is very commonly used. Many of the samples effervesced only very feebly, or not at all on adding acid. The total alkalinity of some is far below that of the official product. The potassium bicarbonate of the formula is very greatly in excess of the quantity required by theory, while in formulas employing potassium hydrate, only a slight excess is provided. The alkalinity of the samples was determined by adding to 5 Cc. of the sample 2 Cc. of normal sulphuric acid V. S., boiling to expel carbon dioxide and titrating back with decinormal alkali, using cochineal as indicator. The arsenous acid has evidently no influence on the titration; arsenic acid of course would have. It is probably because the alternative formula is so generally used that samples of Fowler's Solution vary very greatly in color. It is certainly very unfortunate that this is the case. A product so dangerously poisonous as this ought certainly to be recognizable at sight, at least by the initiated. Compound tincture of lavender is added to it for this express purpose, but it fails to accomplish it if the preparation is not to be made strictly in accordance with the official formula.

Whether Fowler's Solution would be less liable to oxidize if made neutral, or even acid, is an interesting practical question. The fact that it is oxidized by iodine promptly only in alkaline solution suggests that the excess of alkali in the official formula may hasten instead of retarding oxidation. To test this question I have set by solutions of potassium arsenite containing respectively potassium hydrate, potassium carbonate, hydrochloric acid and sulphuric acid, and shall examine them at intervals to see which shows the most rapid oxidation. I find that the official solution of arsenous acid (solution of arsenous chloride) which has been in stock a long time shows no apparent loss in strength, so that I shall expect to find the acid solutions the more stable.

#### CONCLUSIONS.

1. Fowler's Solution under ordinary conditions undergoes progressive oxidation, the arsenite it contains becoming gradually converted into arsenate. Since arsenates are known to be much less poisonous than arsenites, this change is undoubtedly accompanied by loss in therapeutic activity. Hence :



2. Until the subject has been more fully studied, the precaution should be taken to keep Fowler's Solution only in containers completely filled, and in any case to prepare a fresh supply at least as often as once in twelve months. Meanwhile it is incumbent on the U. S. P. Revision Committee to investigate the conditions of stability of solutions of potassium arsenite with an improved formula in view.

3. Presence of arsenate in Fowler's Solution can be best demonstrated by adding to 5 Cc. of the solution 0.5 Cc. of magnesia mixture and shaking the test-tube vigorously a few minutes. If arsenate is present a crystalline precipitate will appear. Allow this to subside, decant the solution as completely as possible, add 5 Cc. of distilled water, decant once more, and to the residue add a few drops of silver nitrate T. S., followed by a drop of acetic acid. Brown silver arsenate will be formed if arsenate were present in more than a mere trace.

4. The U. S. P. test does not show the total quantity of arsenic present in Fowler's Solution, but only the amount that remains unoxidized. The total amount may be determined as magnesium arsenate after oxidizing the sample with hydrogen peroxide, nitric acid or iodine, or else the arsenate may be reduced, as in Gutzeit's test, with sulphurous acid, and the arsenic then determined by titration with iodine V. S.

RESULTS OF EXAMINATION OF SAMPLES OF LIQUOR POTASSII ARSENITIS.

	Per cent. $As_2O_3$ , by Iodine Titration.	Per cent. Oxidized $As_2O_3$ .	Per cent. $As_2O_3$ Total.	Per cent. Alkali as Potass. Bicarb.†	Total.
1* .....	1.000	0.000	1.000	2.00	Normal.
2† .....	0.966	0.014	0.980	1.97	Normal.
3 .....	0.922	0.017	0.939	1.95	Pale.
4 .....	0.912	0.022	0.934	1.89	Pale.
5 .....	0.917	0.011	0.928	1.89	Normal.
6 .....	0.947	0.006	0.952	1.91	Normal.
7 .....	0.954	0.015	0.969	1.97	Dark.
8 .....	0.701	0.012	0.713	2.03	Dark.
9 .....	0.721	0.015	0.736	0.78	Pale.
10 .....	0.902	0.017	0.919	1.99	Dark.
11 .....	0.873	0.021	0.894	0.87	Pale.
12 .....	0.990	0.004	0.994	1.97	Dark.
13 .....	0.848	0.019	0.867	0.89	Normal.
14§ .....	0.652	0.344	0.996	—	—

\* Standard sample, freshly prepared.

† Sample eight months old, which, when made, was said to comply with U. S. P. requirements.

§ Standard 1 % solution of arsenic trioxide as potassium arsenite, containing excess sodium bicarbonate after keeping seventeen months.

‡ Strong effervescence with acids was shown only by numbers 1, 3, 6, 8, 10 and 12.

## ALCOHOL TABLE TO FACILITATE RAPID APPROXIMATE DETERMINATIONS OF ALCOHOL BY APPARENT SPECIFIC GRAVITY.

BY A. B. LYONS, M. D.

Under the present Food and Drugs Act, the pharmacist is under the necessity of making frequent determinations of the alcoholic content of medicinal preparations. These determinations need not be made with great exactness, but it is important that results be reached with a minimum expenditure of time and labor. The distillation method is that which will naturally be adopted, as it is that by which the government officials reach their results. The plan is to measure accurately a convenient volume of the sample, place it in a suitable still, add some water and distil off the spirit, making the volume of the distillate equal exactly to that of the sample taken. The specific gravity of the distillate, in absence of volatile liquids other than alcohol and water, serves to indicate the alcoholic strength of the sample. When exact results are desired, particularly if the per cent. of alcohol is large, it is necessary to be particular that the measurement of the distillate be made at the same temperature as that at which the sample was measured, and to bring the temperature of the distillate exactly to  $15.56^{\circ}$  C. before taking its specific gravity. To do this requires time. It is to save this expenditure of time that the present table has been constructed.

The method of procedure advised is as follows: Measure at room temperature with a graduated pipette exactly 25 Cc. of the sample. Introduce this into a metallic distilling flask, which should have a capacity of at least 300 Cc. Add 50 Cc. of tap water, connect the flask with an efficient condenser, making sure that there is no leakage, and distil slowly into a 50-Cc. measuring flask, until this is filled nearly to the mark.\* The distillation should require 25 or 30 minutes. Be sure that the measuring flask "holds" exactly twice as much fluid as the pipette delivers; it is not important that the actual capacity of the former be exactly 25 Cc. The temperature of the sample when measured should be noted if exact results are sought. Care should be taken in any case that it does not differ by more than  $5^{\circ}$  Fahr. from that at which the distillate is measured. A table is given hereinafter showing what correction should be made in case the temperature at which the two measurements are made is not the same.

When the distillation is finished, add distilled water from a pipette to bring the level of the fluid exactly to the mark. Close the flask with the thumb, and invert a few times to mix its contents thoroughly. It may be

---

\* Some may prefer to make the actual capacity of the flask exactly twice that of the pipette, and then, after measuring the sample into the distilling flask, rinse the pipette twice with water, adding this to the contents of the distilling flask. Where economy of time is an object, this plan is not to be recommended, although in exact work it must be practiced at least in case of dense or viscous liquids.

necessary after this to add a drop or so of water to make up for condensation from the mixing of the stronger with the weaker part of the distillate. Pour the distillate into a small, clean and dry beaker, and note its temperature in Fahrenheit degrees, after stirring well to equalize the temperature of liquid and container. Fill a 25-Gm. pycnometer with the distillate, after rinsing it three times with small portions of the fluid. The object of this is especially to bring the temperature of the pycnometer to that of the liquid; care should be taken that they be of nearly the same temperature to start with. Do not allow any of the liquid to overflow so as to wet the outside of the pycnometer until the stopper is inserted. The instrument should be of the ordinary style, with perforated ground-glass stopper. Dry the outside of the pycnometer rapidly with a soft towel, avoiding any handling that might raise the temperature of its contents, then immediately weigh—the pycnometer being of course furnished with a counterpoise. Reference to the table does the rest.

The pycnometer is assumed to be that which is in general use, *i. e.*, one standardized at 15° C., not at 60° F., although that is standard temperature for alcohol determinations. I have constructed the table for such an instrument rather than one standardized at 25° C., the official standard temperature, because it is next to impossible to procure the latter. The 25-Gm. size is most convenient for these alcohol determinations. It is the smallest that will easily give sufficiently exact results. A larger one involves needless expenditure of time in the distillation, as well as a needless waste of material. The bottle should have a counterpoise which exactly balances it when weighed in air under standard conditions of temperature and barometer. It should hold exactly 25 Gm. of distilled water at 15° C., weighed in air, barometer at 760 Mm. If the station of the observer is not near sea-level, the counterpoise, if adjusted at sea-level, will be apparently too light, unless it is made of glass or some material of similar specific gravity. It should of course be adjusted to an exact balance at the station where it is to be used. The pycnometer itself, at a station above sea-level, will hold apparently more than 25 Gm. of distilled water at 15° C. The difference in weight, which is of course very small, is given in a table hereinafter, and in rectifying the accuracy of the pycnometer, allowance must be made for this difference. For example, at an elevation of 7,000 feet, it will hold 24.006 Gm. The six milligrams will have to be deducted from every weighing, no matter what the gross weight may be. Since one is liable sometimes to forget to make the correction, it is best to make it once for all *by making the counterpoise heavier than the bottle by the amount of this correction*. At elevations above sea-level of less than 500 feet, the correction, being less than half a milligram, may be ignored in rough work, such as we are now considering. Greater errors than this are sure to result from inaccurate noting of the temperature—are inherent indeed necessarily in the table itself.

The thermometer used should have a thin cylindrical bulb. Its stem should not be more than 8 or 10 Cm. in length. The scale should cover a range from 59° to 90° F. Fahrenheit temperatures have been chosen for the table partly because Americans think in Fahrenheit, but also because closer readings are required than are practicable with ordinary centigrade thermometers, the centigrade degree being equal to nearly two Fahrenheit degrees. If a centigrade thermometer is used, its readings require to be interpreted into Fahrenheit notation. The instrument should of course be one known to be correct. If it has an error in any part of the scale of more than 0.5° F., it is not suitable for this use, for corrections for instrumental imperfections not only take much time, but are a constant snare and delusion.

The use of the table is self-evident. Seek for the figure in the uppermost row of figures that is nearest (above) the weight of the contents of the pycnometer. Follow the column down to the line corresponding with the observed temperature of the distillate at the time of the weighing. There will be generally a small correction to add for the odd milligrams, and for fractional degrees of temperature. Example: Suppose the weight of the contents of the pycnometer has been found to be at 78.3° F., 24.293 Gm. Look for the column headed 24.30, follow this down to 78°, where the percentage 20.40 is given. This is to be corrected for 7 Mg., and for 0.3° F. The figure .35 in small type, on the right of the column corresponds with a difference in weight of 10 Mg., hence the first correction, additive, for 7 Mg. ( $24.30 - 24.293$ ), will be  $.35 \times 0.7 = 0.245$ . The second correction, subtractive for 0.3° F., will be three-tenths the "difference" corresponding with one degree, given in small figures in the table, a little above, as .19; therefore it is  $.19 \times 0.3 = .057$ . The percentage of the distillate, corrected, therefore is  $20.40 + 0.25 - 0.06 = 20.59$ . This is to be multiplied by two, since the 50 Cc. of distillate represented only 25 Cc. of the original sample, which therefore contained 41.18 per cent. of alcohol.

If the specific gravity of the distillate is determined by a delicate glass hydrometer, or by a Westphal balance, the plummet of which is of glass, the table may still be used, so long as the standard remains  $\frac{15^\circ \text{C.}}{15^\circ \text{C.}}$ , apparent sp. gr. in air. It is necessary only to divide the figures representing the specific gravity by four and move the decimal point two places to the right, and then proceed as above. If the plummet of the Westphal balance is of metal, of course the temperature corrections will be different from those of this table.

For approximate determinations of alcohol percentages, specially constructed alcoholometers are very convenient. Since the quantity of distillate is small, the instruments must be not larger than an ordinary urinometer. A set of at least five of these is required, each covering a

range of not more than 10 per cent. on a scale at least 5 Cm. long, so that readings can be easily made to one-half of one per cent. I understand that such instruments are in use in France and Germany; I have not found them listed in American catalogues of chemical apparatus. The table may be used in connection with such instruments to furnish the necessary temperature correction. The instruments being made for a standard temperature of 60° F., the reading is to be sought in the line of figures corresponding with that temperature. Thus, if the reading is 22.5 per cent., temperature 76° F., the table will give as the nearest figure 22.70, in the column headed 24.33. Following this column to the temperature 76° we find the figure 19.71, which must be too large by about 0.2, since the figure found in the table was 0.2 in excess of that sought. Hence the true percentage of the distillate is very close to 19.5.

The figures of the alcohol table are derived from an elaborate table published by Dr. Edward W. Morley in the "Journal of the American Chemical Society," October, 1904, but Dr. Morley's table covers a range of temperature extending only from 15° to 22° C., so that the figures for higher temperatures had to be supplied by extrapolation. In Dr. Morley's table the figures represented true density, the standard of comparison being water at 4° C., weighings assumed to be made in vacuum, the percentages all by weight, and temperatures those of a hydrogen centigrade thermometer. Laborious calculations were involved in deducing from these the figures of the present table, in which weighings are assumed to be made in air, so that the specific gravities are apparent, not true; the standard of comparison is water (weighed in air) at 15° C., the degrees are those of the ordinary mercurial Fahrenheit thermometer, and the alcohol percentages are by volume. The figures will be found to differ only very slightly, rarely by more than one-fourth of one per cent., from those of the tables of Tralles and Guy-Lussac.

Of course, where exact percentages are required the longer method will be resorted to, and the tables in ordinary use will be employed. Of these, the most convenient is that contained in Dr. Wiley's "Agricultural Analysis." Nothing need be said here of the expedients that must be resorted to for the exclusion of volatile bodies other than alcohol.

The present table is carried no further than 50 per cent. for the reason that distillates from alcoholic liquids containing more than 40 or 50 per cent. of alcohol are always made up to twice the volume of the original liquid, partly to insure the passing over of the whole of the alcohol into the distillate, partly because the weaker spirit is less liable to change its temperature while weighings are being made, partly also because the change of volume is not so great if temperature changes do occur.

In case of preparations containing less than ten per cent. of alcohol, it is as well to take 50 Cc. for the distillation, obtaining 50 Cc. of distillate. Some prefer to do this in all cases where the alcoholic strength is below

25 per cent. My own preference in routine work is for a uniform procedure, and with a good balance the results are accurate enough for all requirements even in case of fluids containing no more than four or five per cent. of alcohol, when the usual routine is followed.

TABLE OF CORRECTIONS.

For difference in temperature of sample and distillate at time of measurement. If temperature of distillate is higher, subtract from percentage figure given by table; if lower add.

Per cent. by table.	Corrections. for 1° F.	Per cent. by table.	Correction for 1° F.
1	0.0001	26	0.0065
2	0.0002	27	0.0069
3	0.0003	28	0.0074
4	0.0004	29	0.0080
5	0.0006	30	0.0085
6	0.0007	31	0.0091
7	0.0009	32	0.0096
8	0.0010	33	0.0102
9	0.0012	34	0.0108
10	0.0013	35	0.0115
11	0.0015	36	0.0121
12	0.0017	37	0.0127
13	0.0020	38	0.0133
14	0.0022	39	0.0139
15	0.0024	40	0.0144
16	0.0027	41	0.0151
17	0.0029	42	0.0156
18	0.0032	43	0.0162
19	0.0036	44	0.0168
20	0.0039	45	0.0174
21	0.0043	46	0.0180
22	0.0047	47	0.0187
23	0.0051	48	0.0193
24	0.0055	49	0.0199
25	0.0060	50	0.0206

## CORRECTION FOR ELEVATION OF STATION.

Subtract from weight of contents of 25 Gm. pycnometer, or else, preferably, make counterpoise of pycnometer too heavy by amount of the correction.

Elevation above sea level	Correction (subtractive.)	Elevation above sea level.	Correction (subtractive.)
515 Ft.	0.5 Mg.	6,400	5.5
1,040	1.0	6,940	6.0
1,580	1.5		
2,130	2.0	7,620	6.5
		8,310	7.0
2,700	2.5	9,030	7.5
3,270	3.0	9,760	8.0
3,850	3.5		
4,440	4.0	10,520	8.5
		11,290	9.0
5,050	4.5	12,090	9.5
5,560	5.0	12,900	10.0

## CORRECTION FOR REDUCED ATMOSPHERIC PRESSURE.

This of course includes correction for elevation above sea-level. The correction is for apparent weight of contents of 25 Gm. pycnometer.

Corrected reading of Barometer (inches).	Correction (milligrams).	Corrected reading of Barometer (inches).	Correction (milligrams).
31.1	+1.0	24.3	— 5.0
30.6	+0.5	23.8	— 5.5
30.0	+0.0	23.2	— 6.0
29.5	—0.5		
28.9	—1.0	22.7	— 6.5
		22.1	— 7.0
28.3	—1.5	21.5	— 7.5
27.7	—2.0	20.9	— 8.0
27.2	—2.5	20.4	— 8.5
26.6	—3.0		
26.1	—3.5	19.8	— 9.0
		19.3	— 9.5
25.5	—4.0	18.7	—10.0
24.9	—4.5		

## ALCOHOL TABLE.

Giving percentage by volume of absolute alcohol at different temperatures corresponding with different specific gravities.

Tempera- ture, Fahr.	24.99*	24.98	24.97	24.96	24.95	24.94	24.93	24.92	24.91	24.90
59°	0.25%	0.52%	0.78%	1.05%	1.32%	1.59%	1.86%	2.13%	2.40%	2.68%
60°	0.20	.27	.26	.27	.27	.27	.27	.27	.28	.28
61°	.05	.05	.05	.05	.05	.05	.05	.05	.05	.06
62°	0.16	0.42	0.68	0.95	1.21	1.48	1.75	2.02	2.30	2.57
63°	0.11	0.37	0.63	0.90	1.16	1.43	1.70	1.97	2.24	2.51
64°	0.06	.26	.26	.27	.26	.26	.27	.27	.27	.28
65°		0.26	0.52	0.78	1.04	1.30	1.58	1.85	2.11	2.38
		0.20	0.46	0.73	0.99	1.25	1.52	1.79	2.05	2.32
		.06	.06	.06	.06	.06	.06	.06	.06	.07
66°		0.15	0.41	0.67	0.93	1.19	1.45	1.72	1.98	2.25
67°		0.09	0.26	0.53	0.80	1.06	1.32	1.58	1.84	2.10
68°			.25	.25	.26	.26	.26	.26	.27	.27
69°			0.23	0.48	0.73	1.00	1.26	1.52	1.79	2.05
70°			0.17	0.41	0.67	0.93	1.18	1.44	1.71	1.97
			.07	.07	.07	.07	.07	.07	.07	.07
71°			0.10	0.34	0.60	0.86	1.11	1.37	1.64	1.90
72°			0.04	0.27	0.53	0.79	1.03	1.29	1.57	1.83
73°				.24	.26	.26	.25	.26	.26	.27
74°				0.20	0.46	0.72	0.96	1.22	1.49	1.75
75°				0.13	0.39	0.64	0.89	1.15	1.41	1.67
				0.08	0.31	0.56	0.81	1.07	1.33	1.59
					.06	.06	.06	.06	.06	.08
76°					0.24	0.49	0.73	0.99	1.25	1.51
77°					0.16	0.41	0.66	0.91	1.17	1.43
78°					0.08	0.33	0.58	0.82	1.08	1.35
79°					0.00	0.25	0.49	0.73	1.00	1.26
80°						0.17	0.41	0.65	0.91	1.17
						.08	.08	.08	.08	.09
81°						0.09	0.38	0.67	0.93	1.08
82°						0.01	0.25	0.48	0.74	0.90
83°						.24	.25	.26	.26	.26
84°							0.17	0.40	0.66	0.92
85°							0.09	0.31	0.57	0.82
							0.01	0.23	0.48	0.73
							.06	.09	.06	.09
86°								0.14	0.40	0.64
87°								0.05	0.32	0.56
88°									0.22	0.47
89°									0.16	0.39
90°									0.07	0.30

\* Weight (in air) of volume equal to that of 1 Gm. of distilled water weighed in air at 59° F., i. e., an ordinary 25 Gm. specific gravity bottle.



ALCOHOL TABLE—Continued.

Tempera-  
ture,  
Fahr.

24.80	24.86	24.88	24.87	24.86	24.85	24.84	24.83	24.82	24.81	24.80
2.96%	3.25%	3.54%	3.82%	4.11%	4.44%	4.72%	5.02%	5.33%	5.63%	
2.91	3.19	3.48	3.76	4.05	4.35	4.64	4.94	5.26	5.56	.31
.06	.06	.06	.06	.06	.07	.07	.07	.08	.08	
2.85	3.13	3.41	3.70	3.98	4.28	4.57	4.87	5.18	5.48	
2.79	3.07	3.34	3.64	3.92	4.21	4.50	4.80	5.10	5.40	
2.73	3.00	3.28	3.57	3.85	4.14	4.43	4.73	5.03	5.33	.31
2.66	2.94	3.22	3.50	3.78	4.07	4.35	4.65	4.95	5.25	
2.60	2.87	3.15	3.43	3.71	4.00	4.28	4.57	4.87	5.17	
.07	.07	.07	.08	.08	.08	.08	.08	.08	.08	
2.53	2.80	3.08	3.36	3.64	3.92	4.21	4.49	4.79	5.09	
2.46	2.73	3.01	3.28	3.56	3.84	4.13	4.41	4.70	5.00	
2.39	2.66	2.94	3.21	3.49	3.77	4.05	4.33	4.62	4.92	.30
2.32	2.58	2.86	3.13	3.41	3.69	3.97	4.25	4.54	4.84	
2.24	2.51	2.79	3.05	3.33	3.61	3.89	4.17	4.45	4.75	
.07	.08	.08	.08	.08	.08	.08	.09	.09	.09	
2.17	2.43	2.71	2.98	3.25	3.53	3.81	4.09	4.37	4.67	
2.10	2.36	2.63	2.90	3.17	3.45	3.73	4.01	4.29	4.58	
2.02	2.28	2.54	2.82	3.09	3.37	3.64	3.92	4.20	4.49	.30
1.94	2.20	2.46	2.74	3.01	3.28	3.56	3.84	4.11	4.40	
1.86	2.12	2.38	2.66	2.93	3.20	3.47	3.75	4.02	4.31	
.08	.08	.09	.09	.09	.09	.09	.09	.09	.09	
1.77	2.04	2.30	2.57	2.84	3.11	3.39	3.67	3.94	4.22	
1.69	1.95	2.21	2.49	2.76	3.03	3.30	3.58	3.85	4.13	
1.60	1.87	2.13	2.40	2.67	2.94	3.21	3.49	3.76	4.04	.29
1.51	1.78	2.04	2.31	2.58	2.85	3.12	3.39	3.67	3.94	
1.42	1.69	1.95	2.22	2.49	2.76	3.03	3.30	3.58	3.85	
.09	.09	.09	.09	.09	.09	.09	.09	.09	.09	
1.33	1.60	1.86	2.13	2.40	2.67	2.94	3.21	3.48	3.75	
1.25	1.52	1.78	2.04	2.31	2.58	2.85	3.12	3.39	3.66	
1.16	1.43	1.69	1.96	2.23	2.50	2.77	3.04	3.30	3.56	.27
1.07	1.35	1.61	1.87	2.14	2.41	2.68	2.94	3.21	3.47	
0.99	1.26	1.52	1.78	2.06	2.32	2.59	2.86	3.11	3.37	
.09	.09	.09	.09	.09	.09	.09	.09	.09	.09	
0.90	1.17	1.43	1.69	1.96	2.23	2.50	2.76	3.02	3.27	.30
0.82	1.09	1.35	1.60	1.87	2.14	2.41	2.67	2.93	3.18	
0.73	1.00	1.26	1.52	1.79	2.06	2.32	2.58	2.84	3.08	.25
0.65	0.92	1.18	1.43	1.70	1.97	2.23	2.49	2.74	2.98	
0.56	0.83	1.09	1.34	1.61	1.88	2.14	2.40	2.65	2.89	

ALCOHOL TABLE—Continued.

Temper- ature, Fahr.	24.79	24.78	24.77	24.76	24.75	24.74	24.73	24.72	24.71	24.70	24.69
59°	5.94%	6.26%	6.57%	6.88%	7.20%	7.52%	7.85%	8.18%	8.50%	8.83%	9.16%
60°	5.87	6.18	6.49	6.81	7.13	7.45	7.77	8.10	8.42	8.74	9.07
	.08	.08	.08	.08	.08	.08	.08	.09	.09	.09	.09
61°	5.79	6.11	6.42	6.73	7.05	7.37	7.68	8.01	8.33	8.66	8.99
62°	5.71	6.03	6.34	6.65	6.97	7.29	7.60	7.92	8.24	8.57	8.90
63°	5.64	5.95	6.26	6.57	6.88	7.20	7.51	7.83	8.15	8.48	8.81
64°	5.56	5.87	6.18	6.49	6.80	7.12	7.43	7.75	8.06	8.39	8.72
65°	5.48	5.79	6.10	6.41	6.72	7.04	7.34	7.66	7.98	8.30	8.62
	.09	.09	.09	.09	.09	.09	.09	.09	.10	.10	.10
66°	5.39	5.70	6.01	6.32	6.63	6.94	7.25	7.57	7.89	8.21	8.53
67°	5.30	5.62	5.93	6.23	6.54	6.85	7.16	7.48	7.79	8.11	8.43
68°	5.22	5.53	5.85	6.15	6.45	6.76	7.07	7.39	7.70	8.02	8.34
69°	5.14	5.45	5.76	6.06	6.36	6.67	6.98	7.29	7.60	7.92	8.24
70°	5.05	5.36	5.67	5.97	6.27	6.58	6.89	7.20	7.50	7.82	8.14
	.09	.09	.10	.10	.10	.10	.10	.10	.10	.10	.10
71°	4.97	5.27	5.58	5.88	6.18	6.49	6.80	7.11	7.41	7.72	8.04
72°	4.88	5.18	5.48	5.78	6.08	6.39	6.70	7.01	7.31	7.62	7.94
73°	4.79	5.08	5.38	5.68	5.99	6.30	6.60	6.91	7.21	7.52	7.84
74°	4.69	4.99	5.29	5.59	5.89	6.20	6.50	6.80	7.11	7.42	7.73
75°	4.60	4.89	5.19	5.49	5.79	6.10	6.40	6.70	7.01	7.32	7.63
	.09	.10	.10	.10	.10	.10	.10	.10	.11	.11	.11
76°	4.51	4.79	5.09	5.39	5.69	5.99	6.30	6.60	6.91	7.21	7.52
77°	4.42	4.69	4.99	5.29	5.59	5.89	6.20	6.50	6.81	7.11	7.42
78°	4.32	4.60	4.89	5.19	5.48	5.78	6.09	6.39	6.70	7.00	7.31
79°	4.23	4.50	4.78	5.09	5.38	5.68	5.99	6.29	6.59	6.89	7.20
80°	4.13	4.40	4.68	4.98	5.27	5.57	5.88	6.18	6.48	6.78	7.09
	.10	.10	.10	.10	.10	.11	.11	.11	.11	.11	.11
81°	4.03	4.30	4.58	4.87	5.16	5.46	5.77	6.07	6.37	6.67	6.97
82°	3.95	4.20	4.47	4.77	5.05	5.35	5.66	5.96	6.25	6.55	6.85
83°	3.84	4.10	4.37	4.66	4.95	5.24	5.54	5.84	6.14	6.44	6.74
84°	3.74	4.00	4.27	4.56	4.84	5.13	5.43	5.73	6.02	6.32	6.63
85°	3.64	3.90	4.17	4.45	4.74	5.02	5.32	5.62	5.91	6.21	6.51
	.10	.10	.10	.11	.11	.11	.11	.11	.12	.12	.12
86°	3.54	3.79	4.06	4.34	4.63	4.91	5.21	5.51	5.79	6.09	6.39
87°	3.44	3.69	3.96	4.23	4.52	4.80	5.09	5.38	5.68	5.98	6.27
88°	3.33	3.58	3.85	4.13	4.41	4.69	4.98	5.28	5.58	5.88	6.18
89°	3.23	3.48	3.75	4.02	4.31	4.59	4.88	5.18	5.48	5.78	6.08
90°	3.13	3.38	3.65	3.92	4.20	4.48	4.77	5.06	5.35	5.64	5.93

Temper-  
ature,  
Fahr.

ALCOHOL TABLE—Continued.

24.68	24.67	24.66	24.65	24.64	24.63	24.62	24.61	24.60	24.59	24.58
59° 9.49% 9.40	9.83% 9.74	10.18% 10.08	10.53% 10.43	10.89% 10.79	11.25% 11.15	11.61% 11.51	11.98% 11.87	12.34% 12.23	12.71% 12.60	13.08% 12.97
60° .09	.34	.35	.35	.36	.36	.36	.36	.37	.37	.37
61° 9.31	9.65	10.00	10.34	10.69	11.05	11.40	11.76	12.12	12.48	12.85
62° 9.22	9.56	9.90	10.24	10.59	10.94	11.29	11.65	12.01	12.37	12.74
63° 9.13	9.47	.33	10.13	10.48	.35	11.19	11.54	11.90	12.26	.36
64° 9.03	9.37	9.69	10.03	10.38	10.73	11.08	11.43	11.79	12.15	12.50
65° 8.94	9.27	9.59	9.93	10.28	10.62	10.97	11.32	11.68	12.04	12.39
66° .10	.10	.40	.30	.30	.31	.31	.32	.32	.32	.32
67° 8.85	9.17	9.53	9.83	10.17	10.51	10.86	11.21	11.56	11.92	12.27
68° 8.75	9.07	9.40	9.73	10.07	10.40	10.75	11.10	11.45	11.81	12.15
69° 8.66	8.98	.32	9.62	9.96	.33	10.63	10.98	.35	11.33	.36
70° 8.56	8.88	9.19	9.52	9.86	10.19	10.52	10.86	11.20	11.56	11.90
71° 8.46	8.78	9.08	9.41	9.75	10.08	10.41	10.74	11.09	11.44	11.78
72° .10	.10	.31	.31	.31	.32	.32	.32	.32	.32	.32
73° 8.35	8.67	8.99	9.31	9.64	9.96	10.30	10.63	10.97	11.31	11.65
74° 8.25	8.57	8.88	9.20	9.53	9.85	10.18	10.51	10.85	11.19	11.53
75° 8.15	8.47	.30	8.77	9.10	9.42	.33	10.39	.34	10.73	.34
76° 8.04	8.36	8.66	8.98	9.30	9.62	9.95	10.28	10.61	10.95	11.28
77° 7.94	8.26	8.56	8.88	9.19	9.51	9.83	10.16	10.48	10.82	11.15
78° .11	.11	.31	.31	.31	.32	.32	.32	.33	.33	.33
79° 7.83	8.15	8.45	8.77	9.08	9.39	9.71	10.03	10.36	10.69	11.02
80° 7.72	8.04	8.35	8.66	8.97	9.28	9.60	9.91	10.23	10.56	10.89
81° 7.61	7.93	.31	8.24	8.56	8.87	9.18	9.49	9.81	10.13	.32
82° 7.50	7.81	8.13	8.44	8.75	9.05	9.36	9.67	9.98	10.30	10.62
83° 7.39	7.70	8.01	8.32	8.62	8.93	9.24	9.54	9.85	10.17	10.49
84° .11	.12	.32	.32	.32	.32	.32	.32	.33	.33	.34
85° 7.27	7.58	7.89	8.20	8.50	8.80	9.11	9.41	9.72	10.04	10.36
86° 7.15	7.46	7.77	8.08	8.38	8.68	8.99	9.29	9.59	9.91	10.22
87° 7.04	7.35	.31	7.66	7.96	8.25	.31	8.57	.30	9.47	.31
88° 6.93	7.23	7.54	7.84	8.13	8.43	8.74	9.04	9.34	9.64	9.95
89° 6.81	7.11	7.42	7.72	8.01	8.31	8.62	8.91	9.21	9.51	9.81
90° .12	.12	.32	.32	.32	.32	.32	.32	.33	.33	.34
91° 6.69	6.99	7.30	7.60	7.89	8.18	8.49	8.78	9.08	9.38	9.68
92° 6.57	6.87	7.17	7.47	7.76	8.06	8.37	8.67	8.96	9.26	9.56
93° 6.45	6.75	.30	7.05	7.34	.31	8.24	8.53	8.82	9.11	.30
94° 6.33	6.63	6.93	7.23	7.52	7.81	8.12	8.40	8.69	8.97	9.28
95° 6.21	6.51	6.81	7.11	7.40	7.69	7.99	8.28	8.56	8.84	9.14

ALCOHOL TABLE—Continued.

Temper- ature, Fahr.	24.57	24.56	24.55	24.54	24.53	24.52	24.51	24.50	24.49	24.48	24.47
59°	13.45%	13.83%	14.20%	14.58%	14.97%	15.36%	15.75%	16.14%	16.54%	16.94%	17.34%
60°	13.34	13.71	14.08	14.45	14.84	15.22	15.61	16.00	16.40	16.79	17.19
	.12	.13	.12	.13	.13	.13	.14	.14	.14	.15	.15
61°	13.22	13.59	13.95	14.32	14.70	15.07	15.47	15.86	16.25	16.64	17.03
62°	13.10	13.47	13.83	14.20	14.57	14.94	15.33	15.72	16.11	16.49	16.88
63°	12.98	13.34	13.70	14.07	14.44	14.81	15.19	15.57	15.96	16.34	16.73
64°	12.86	13.22	13.58	13.95	14.30	14.67	15.05	15.43	15.82	16.19	16.58
65°	12.74	13.09	13.45	13.82	14.17	14.54	14.91	15.29	15.67	16.04	16.43
	.13	.13	.13	.13	.13	.14	.14	.15	.15	.15	.15
66°	12.63	12.98	13.33	13.69	14.04	14.41	14.77	15.15	15.52	15.90	16.28
67°	12.50	12.85	13.20	13.55	13.91	14.27	14.63	15.01	15.38	15.75	16.13
68°	12.38	12.72	13.07	13.42	13.78	14.14	14.49	14.86	15.23	15.60	15.98
69°	12.25	12.59	12.94	13.29	13.64	14.00	14.35	14.72	15.08	15.45	15.83
70°	12.12	12.46	12.81	13.16	13.51	13.86	14.22	14.58	14.94	15.30	15.67
	.13	.13	.13	.13	.13	.14	.14	.14	.14	.15	.15
71°	12.00	12.34	12.68	13.02	13.37	13.72	14.08	14.44	14.89	15.16	15.52
72°	11.87	12.21	12.55	12.89	13.24	13.58	13.94	14.29	14.65	15.01	15.37
73°	11.74	12.08	12.42	12.76	13.10	13.45	13.80	14.15	14.50	14.86	15.22
74°	11.61	11.96	12.29	12.63	12.97	13.31	13.66	14.01	14.36	14.71	15.07
75°	11.48	11.82	12.14	12.49	12.84	13.17	13.52	13.87	14.22	14.57	14.92
	.13	.14	.14	.14	.14	.14	.14	.15	.15	.15	.15
76°	11.35	11.68	12.02	12.36	12.70	13.04	13.38	13.72	14.07	14.42	14.77
77°	11.22	11.55	11.88	12.22	12.56	12.90	13.24	13.58	13.93	14.27	14.62
78°	11.09	11.42	11.75	12.09	12.42	12.76	13.10	13.44	13.78	14.12	14.47
79°	10.95	11.28	11.61	11.95	12.28	12.62	12.96	13.30	13.63	13.98	14.32
80°	10.81	11.14	11.47	11.81	12.14	12.48	12.81	13.15	13.48	13.83	14.17
	.14	.14	.14	.14	.14	.14	.14	.15	.15	.15	.15
81°	10.68	11.00	11.33	11.66	12.00	12.34	12.67	13.00	13.34	13.68	14.02
82°	10.54	10.86	11.19	11.52	11.86	12.19	12.52	12.86	13.19	13.53	13.87
83°	10.41	10.72	11.04	11.37	11.71	12.05	12.38	12.71	13.05	13.38	13.71
84°	10.27	10.58	10.90	11.23	11.57	11.90	12.23	12.57	12.90	13.23	13.56
85°	10.13	10.44	10.76	11.09	11.43	11.76	12.09	12.42	12.75	13.08	13.41
	.14	.14	.14	.14	.14	.15	.15	.15	.15	.15	.15
86°	9.99	10.30	10.62	10.95	11.29	11.61	11.94	12.27	12.60	12.93	13.26
87°	9.85	10.16	10.48	10.81	11.14	11.47	11.80	12.12	12.45	12.78	13.09
88°	9.71	10.02	10.34	10.67	11.00	11.32	11.65	11.98	12.30	12.62	12.94
89°	9.57	9.88	10.20	10.52	10.85	11.18	11.51	11.83	12.16	12.48	12.80
90°	9.43	9.74	10.06	10.38	10.71	11.03	11.36	11.68	12.00	12.32	12.64

ALCOHOL TABLE.—(Continued.)

Temper-  
ature,  
Fahr.

24.36	24.45	24.44	24.43	24.42	24.41	24.40	24.39	24.37	24.36
53° 17.74% 60° 17.58 .40	18.44% 17.88 .40	18.54% 18.38 .40	18.93% 18.77 .39	19.33% 19.16 .39	19.72% 19.55 .40	20.12% 19.95 .40	20.52% 20.34 .39	20.91% 20.73 .40	21.31% 21.13 .39
	.16	.16	.16	.16	.17	.17	.17	.18	.18
61° 17.43	17.82	18.21	18.60	18.99	19.38	19.77	20.17	20.56	20.95
62° 17.28	17.67	18.06	18.44	18.83	19.21	19.60	20.08	20.46	20.85
63° 17.12	17.51 .39	17.90 .38	18.28 .39	18.67 .38	19.05 .38	19.43 .39	19.82 .38	20.20 .39	20.59 .38
64° 16.97	17.35	17.74	18.12	18.51	18.88	19.26	19.64	20.02	20.40
65° 16.81	17.19	17.58	17.96	18.34	18.71	19.09	19.47	19.84	20.22
	.16	.16	.16	.17	.17	.17	.17	.18	.18
66° 16.65	17.03	17.42	17.79	18.17	18.54	18.91	19.29	19.66	20.04
67° 16.50	16.88	17.26	17.63	18.00	18.37	18.74	19.12	19.49	19.87
68° 16.34 .38	16.72 .38	17.10 .37	17.47 .37	17.84 .36	18.21 .37	18.57 .37	18.94 .37	19.31 .38	19.69 .37
69° 16.19	16.56	16.94	17.30	17.67	18.03	18.40	18.77	19.14	19.52
70° 16.04	16.41	16.78	17.14	17.51	17.87	18.24	18.60	18.97	19.34
	.16	.16	.16	.16	.17	.17	.17	.17	.18
71° 15.88	16.25	16.62	16.98	17.34	17.70	18.07	18.43	18.80	19.16
72° 15.73	16.09	16.45	16.81	17.17	17.54	17.90	18.26	18.63	18.99
73° 15.58	15.94 .36	16.30 .35	16.65 .36	17.01 .36	17.37 .36	17.73 .36	18.09 .36	18.45 .36	18.81 .36
74° 15.42	15.78	16.14	16.49	16.85	17.20	17.56	17.92	18.28	18.64
75° 15.27	15.63	15.99	16.34	16.69	17.04	17.40	17.76	18.11	18.47
	.16	.16	.16	.16	.16	.17	.17	.17	.17
76° 15.12	15.47	15.82	16.17	16.53	16.88	17.23	17.59	17.94	18.29
77° 14.96	15.31	15.66	16.01	16.36	16.71	17.06	17.42	17.77	18.12
78° 14.81 .34	15.15 .35	15.50 .35	15.85 .35	16.20 .35	16.55 .35	16.90 .35	17.25 .35	17.60 .35	17.95 .35
79° 14.66	15.00	15.34	15.69	16.04	16.39	16.73	17.08	17.43	17.78
80° 14.51	14.85	15.19	15.53	15.87	16.22	16.56	16.91	17.26	17.60
	.16	.16	.16	.16	.16	.17	.17	.17	.18
81° 14.35	14.69	15.03	15.37	15.71	16.05	16.39	16.74	17.08	17.43
82° 14.20	14.53	14.87	15.21	15.55	15.89	16.22	16.57	16.91	17.26
83° 14.04 .33	14.37 .34	14.71 .34	15.04 .34	15.38 .34	15.72 .34	16.06 .34	16.40 .34	16.73 .35	17.08 .34
84° 13.89	14.22	14.55	14.88	15.22	15.56	15.89	16.23	16.56	16.91
85° 13.73	14.06	14.39	14.72	15.05	15.38	15.72	16.06	16.39	16.73
	.16	.16	.16	.17	.17	.17	.17	.18	.18
86° 13.57	13.90	14.23	14.56	14.89	15.22	15.55	15.89	16.22	16.56
87° 13.41	13.74	14.06	14.39	14.72	15.05	15.38	15.72	16.05	16.38
88° 13.26	13.58 .32	13.90 .33	14.23 .33	14.56 .33	14.89 .33	15.22 .33	15.55 .33	15.87 .33	16.21 .33
89° 13.10	13.42	13.74	14.06	14.39	14.72	15.04	15.37	15.70	16.03
90° 12.94	13.25	13.57	13.90	14.22	14.55	14.87	15.20	15.52	15.85

ALCOHOL TABLE—Continued.

Temper- ature, Fahr.	24.35	24.34	24.33	24.32	24.31	24.30	24.29	24.28	24.27	24.26	24.25
59°	22.10% .40	22.50% .39	22.89% .38	23.29% .37	23.68% .36	24.07% .35	24.46% .34	24.84% .33	25.23% .32	25.62% .31	26.00% .30
60°	21.01% .39	22.31% .38	22.70% .37	23.09% .36	23.48% .35	23.87% .34	24.26% .33	24.64% .32	25.02% .31	25.41% .30	25.79% .29
61°	21.72% .38	22.11% .37	22.50% .36	22.89% .35	23.28% .34	23.67% .33	24.05% .32	24.44% .31	24.81% .30	25.20% .29	25.58% .28
62°	21.54% .37	21.92% .36	22.31% .35	22.70% .34	23.08% .33	23.47% .32	23.85% .31	24.23% .30	24.61% .29	25.00% .28	25.37% .27
63°	21.35% .36	21.73% .35	22.11% .34	22.50% .33	22.88% .32	23.27% .31	23.65% .30	24.03% .29	24.40% .28	24.78% .27	25.16% .26
64°	21.16% .35	21.54% .34	21.92% .33	22.31% .32	22.69% .31	23.07% .30	23.45% .29	23.82% .28	24.20% .27	24.57% .26	24.95% .25
65°	20.98% .34	21.36% .33	21.74% .32	22.12% .31	22.49% .30	22.87% .29	23.25% .28	23.62% .27	23.99% .26	24.37% .25	24.74% .24
66°	20.79% .33	21.17% .32	21.55% .31	21.92% .30	22.30% .29	22.68% .28	23.05% .27	23.42% .26	23.79% .25	24.16% .24	24.53% .23
67°	20.61% .32	20.99% .31	21.36% .30	21.73% .29	22.10% .28	22.48% .27	22.85% .26	23.22% .25	23.59% .24	23.96% .23	24.32% .22
68°	20.43% .31	20.80% .30	21.17% .29	21.54% .28	21.90% .27	22.28% .26	22.65% .25	23.02% .24	23.39% .23	23.75% .22	24.12% .21
69°	20.25% .30	20.62% .29	20.98% .28	21.35% .27	21.71% .26	22.09% .25	22.46% .24	22.83% .23	23.19% .22	23.54% .21	23.91% .20
70°	20.07% .29	20.44% .28	20.81% .27	21.17% .26	21.53% .25	21.90% .24	22.26% .23	22.63% .22	22.99% .21	23.34% .20	23.70% .19
71°	19.89% .28	20.26% .27	20.62% .26	20.99% .25	21.34% .24	21.72% .23	22.08% .22	22.44% .21	22.80% .20	23.15% .19	23.50% .18
72°	19.71% .27	20.08% .26	20.44% .25	20.81% .24	21.16% .23	21.53% .22	21.89% .21	22.24% .20	22.60% .19	22.95% .18	23.30% .17
73°	19.53% .26	19.90% .25	20.25% .24	20.62% .23	20.97% .22	21.34% .21	21.70% .20	22.05% .19	22.40% .18	22.75% .17	23.10% .16
74°	19.35% .25	19.71% .24	20.07% .23	20.43% .22	20.79% .21	21.15% .20	21.51% .19	21.86% .18	22.21% .17	22.55% .16	22.90% .15
75°	19.17% .24	19.53% .23	19.89% .22	20.25% .21	20.61% .20	20.97% .19	21.32% .18	21.67% .17	22.01% .16	22.35% .15	22.70% .14
76°	19.00% .23	19.36% .22	19.71% .21	20.07% .20	20.42% .19	20.78% .18	21.13% .17	21.48% .16	21.82% .15	22.16% .14	22.50% .13
77°	18.82% .22	19.18% .21	19.53% .20	19.88% .19	20.24% .18	20.59% .17	20.94% .16	21.29% .15	21.63% .14	21.96% .13	22.30% .12
78°	18.65% .21	19.00% .20	19.35% .19	19.69% .18	20.05% .17	20.40% .16	20.75% .15	21.10% .14	21.44% .13	21.77% .12	22.11% .11
79°	18.48% .20	18.82% .19	19.17% .18	19.51% .17	19.86% .16	20.21% .15	20.55% .14	20.90% .13	21.24% .12	21.57% .11	21.91% .10
80°	18.30% .19	18.64% .18	18.98% .17	19.33% .16	19.67% .15	20.01% .14	20.35% .13	20.70% .12	21.03% .11	21.37% .10	21.71% .09
81°	18.12% .18	18.46% .17	18.81% .16	19.15% .15	19.48% .14	19.82% .13	20.16% .12	20.50% .11	20.84% .10	21.18% .09	21.51% .08
82°	17.94% .17	18.28% .16	18.63% .15	18.96% .14	19.30% .13	19.63% .12	19.97% .11	20.31% .10	20.65% .09	20.98% .08	21.31% .07
83°	17.76% .16	18.10% .15	18.44% .14	18.78% .13	19.11% .12	19.45% .11	19.78% .10	20.12% .09	20.46% .08	20.78% .07	21.12% .06
84°	17.59% .15	17.92% .14	18.26% .13	18.59% .12	18.92% .11	19.26% .10	19.59% .09	19.93% .08	20.26% .07	20.59% .06	20.92% .05
85°	17.41% .14	17.74% .13	18.08% .12	18.41% .11	18.74% .10	19.07% .09	19.40% .08	19.74% .07	20.07% .06	20.39% .05	20.72% .04
86°	17.23% .13	17.56% .12	17.90% .11	18.22% .10	18.54% .09	18.88% .08	19.21% .07	19.54% .06	19.87% .05	20.19% .04	20.52% .03
87°	17.05% .12	17.38% .11	17.71% .10	18.04% .09	18.36% .08	18.69% .07	19.02% .06	19.35% .05	19.68% .04	20.00% .03	20.32% .02
88°	16.87% .11	17.19% .10	17.53% .09	17.85% .08	18.17% .07	18.50% .06	18.82% .05	19.15% .04	19.48% .03	19.80% .02	20.12% .01
89°	16.69% .10	17.01% .09	17.34% .08	17.66% .07	17.98% .06	18.31% .05	18.64% .04	18.96% .03	19.28% .02	19.60% .01	19.92% .00
90°	16.51% .09	16.83% .08	17.15% .07	17.47% .06	17.79% .05	18.12% .04	18.44% .03	18.76% .02	19.08% .01	19.40% .00	19.72% .00

ALCOHOL TABLE—Continued.

ALCOHOL TABLE.—Continued.													
Temper- ature, Fahr.	24.24	24.23	24.22	24.21	24.20	24.19	24.18	24.17	24.16	24.15	24.14		
26.38°	.37	.26	.27	.36	.27	.35	.28	.35	.34	.28	.24		
26.16	.37	.26	.26	.36	.26	.35	.28	.35	.34	.28	.24		
25.95°	.36	.25	.25	.35	.25	.34	.27	.34	.33	.27	.23		
25.73	.36	.25	.25	.35	.25	.34	.27	.34	.33	.27	.23		
25.52	.36	.25	.25	.35	.25	.34	.27	.34	.33	.27	.23		
25.31	.36	.25	.25	.35	.25	.34	.27	.34	.33	.27	.23		
25.10	.36	.25	.25	.35	.25	.34	.27	.34	.33	.27	.23		
24.89°	.35	.24	.24	.34	.24	.33	.26	.33	.32	.26	.22		
24.68	.35	.24	.24	.34	.24	.33	.26	.33	.32	.26	.22		
24.47	.35	.24	.24	.34	.24	.33	.26	.33	.32	.26	.22		
24.26	.35	.24	.24	.34	.24	.33	.26	.33	.32	.26	.22		
24.05°	.34	.23	.23	.33	.23	.32	.25	.32	.31	.25	.21		
23.85	.34	.23	.23	.33	.23	.32	.25	.32	.31	.25	.21		
23.64	.34	.23	.23	.33	.23	.32	.25	.32	.31	.25	.21		
23.43	.34	.23	.23	.33	.23	.32	.25	.32	.31	.25	.21		
23.22	.34	.23	.23	.33	.23	.32	.25	.32	.31	.25	.21		
23.01°	.33	.22	.22	.32	.22	.31	.24	.31	.30	.24	.20		
22.80	.33	.22	.22	.32	.22	.31	.24	.31	.30	.24	.20		
22.59	.33	.22	.22	.32	.22	.31	.24	.31	.30	.24	.20		
22.38°	.32	.21	.21	.31	.21	.30	.23	.30	.29	.23	.19		
22.17	.32	.21	.21	.31	.21	.30	.23	.30	.29	.23	.19		
21.96	.32	.21	.21	.31	.21	.30	.23	.30	.29	.23	.19		
21.75°	.31	.20	.20	.30	.20	.29	.22	.29	.28	.22	.18		
21.54	.31	.20	.20	.30	.20	.29	.22	.29	.28	.22	.18		
21.33	.31	.20	.20	.30	.20	.29	.22	.29	.28	.22	.18		
21.12°	.30	.19	.19	.29	.19	.28	.21	.28	.27	.21	.17		
20.91	.30	.19	.19	.29	.19	.28	.21	.28	.27	.21	.17		
20.70°	.29	.18	.18	.28	.18	.27	.20	.27	.26	.20	.16		
20.49	.29	.18	.18	.28	.18	.27	.20	.27	.26	.20	.16		
20.28°	.28	.17	.17	.27	.17	.26	.19	.26	.25	.19	.15		
20.07	.28	.17	.17	.27	.17	.26	.19	.26	.25	.19	.15		
19.86°	.27	.16	.16	.26	.16	.25	.18	.25	.24	.18	.14		
19.65	.27	.16	.16	.26	.16	.25	.18	.25	.24	.18	.14		
19.44°	.26	.15	.15	.25	.15	.24	.17	.24	.23	.17	.13		
19.23	.26	.15	.15	.25	.15	.24	.17	.24	.23	.17	.13		
19.02°	.25	.14	.14	.24	.14	.23	.16	.23	.22	.16	.12		
18.81	.25	.14	.14	.24	.14	.23	.16	.23	.22	.16	.12		
18.60°	.24	.13	.13	.23	.13	.22	.15	.22	.21	.15	.11		
18.39	.24	.13	.13	.23	.13	.22	.15	.22	.21	.15	.11		
18.18°	.23	.12	.12	.22	.12	.21	.14	.21	.20	.14	.10		
17.97	.23	.12	.12	.22	.12	.21	.14	.21	.20	.14	.10		
17.76°	.22	.11	.11	.21	.11	.20	.13	.20	.19	.13	.09		
17.55	.22	.11	.11	.21	.11	.20	.13	.20	.19	.13	.09		
17.34°	.21	.10	.10	.20	.10	.19	.12	.19	.18	.12	.08		
17.13	.21	.10	.10	.20	.10	.19	.12	.19	.18	.12	.08		
16.92°	.20	.09	.09	.19	.09	.18	.11	.18	.17	.11	.07		
16.71	.20	.09	.09	.19	.09	.18	.11	.18	.17	.11	.07		
16.50°	.19	.08	.08	.18	.08	.17	.10	.17	.16	.10	.06		
16.29	.19	.08	.08	.18	.08	.17	.10	.17	.16	.10	.06		
16.08°	.18	.07	.07	.17	.07	.16	.09	.16	.15	.09	.05		
15.87	.18	.07	.07	.17	.07	.16	.09	.16	.15	.09	.05		
15.66°	.17	.06	.06	.16	.06	.15	.08	.15	.14	.08	.04		
15.45	.17	.06	.06	.16	.06	.15	.08	.15	.14	.08	.04		
15.24°	.16	.05	.05	.15	.05	.14	.07	.14	.13	.07	.03		
15.03	.16	.05	.05	.15	.05	.14	.07	.14	.13	.07	.03		
14.82°	.15	.04	.04	.14	.04	.13	.06	.13	.12	.06	.02		
14.61	.15	.04	.04	.14	.04	.13	.06	.13	.12	.06	.02		
14.40°	.14	.03	.03	.13	.03	.12	.05	.12	.11	.05	.01		
14.19	.14	.03	.03	.13	.03	.12	.05	.12	.11	.05	.01		
13.98°	.13	.02	.02	.12	.02	.11	.04	.11	.10	.04	.00		
13.77	.13	.02	.02	.12	.02	.11	.04	.11	.10	.04	.00		
13.56°	.12	.01	.01	.11	.01	.10	.03	.10	.09	.03	.00		
13.35	.12	.01	.01	.11	.01	.10	.03	.10	.09	.03	.00		
13.14°	.11	.00	.00	.10	.00	.09	.02	.09	.08	.02	.00		
12.93	.11	.00	.00	.10	.00	.09	.02	.09	.08	.02	.00		
12.72°	.10	.00	.00	.09	.00	.08	.01	.08	.07	.01	.00		
12.51	.10	.00	.00	.09	.00	.08	.01	.08	.07	.01	.00		
12.30°	.09	.00	.00	.08	.00	.07	.00	.07	.06	.00	.00		
12.09	.09	.00	.00	.08	.00	.07	.00	.07	.06	.00	.00		
11.88°	.08	.00	.00	.07	.00	.06	.00	.06	.05	.00	.00		
11.67	.08	.00	.00	.07	.00	.06	.00	.06	.05	.00	.00		
11.46°	.07	.00	.00	.06	.00	.05	.00	.05	.04	.00	.00		
11.25	.07	.00	.00	.06	.00	.05	.00	.05	.04	.00	.00		
11.04°	.06	.00	.00	.05	.00	.04	.00	.04	.03	.00	.00		
10.83	.06	.00	.00	.05	.00	.04	.00	.04	.03	.00	.00		
10.62°	.05	.00	.00	.04	.00	.03	.00	.03	.02	.00	.00		
10.41	.05	.00	.00	.04	.00	.03	.00	.03	.02	.00	.00		
10.20°	.04	.00	.00	.03	.00	.02	.00	.02	.01	.00	.00		
9.99	.04	.00	.00	.03	.00	.02	.00	.02	.01	.00	.00		
9.78°	.03	.00	.00	.02	.00	.01	.00	.01	.00	.00	.00		
9.57	.03	.00	.00	.02	.00	.01	.00	.01	.00	.00	.00		
9.36°	.02	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00		
9.15	.02	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00		
8.94°	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
8.73	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
8.52°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
8.31	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
8.10°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
7.89	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
7.68°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
7.47	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
7.26°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
7.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
6.84°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
6.63	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
6.42°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
6.21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
6.00°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
5.79	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
5.58°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
5.37	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
5.16°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
4.95	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
4.74°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
4.53	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
4.32°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
4.11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
3.90°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
3.69	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
3.48°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
3.27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
3.06°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
2.85	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
2.64°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
2.43	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
2.22°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
2.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
1.80°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
1.59	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
1.38°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
1.17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
0.96°	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
0.75	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
0.54°	.00	.00	.00	.									

ALCOHOL TABLE—Continued.

Temper- ature, Fahr.	24.13	24.12	24.11	24.10	24.09	24.08	24.07	24.06	24.05	24.04	24.03
59°	30.26% .33	30.59% .33	30.92% .33	31.25% .33	31.58% .33	31.91% .33	32.23% .32	32.55% .32	32.87% .32	33.18% .31	33.49% .31
60°	30.03 .22	30.36 .22	30.70 .22	31.03 .22	31.36 .22	31.69 .22	32.01 .22	32.32 .22	32.64 .22	32.95 .22	33.27 .22
61°	29.81 .22	30.14 .22	30.47 .22	30.80 .22	31.13 .22	31.46 .22	31.78 .22	32.10 .22	32.42 .22	32.73 .22	33.04 .22
62°	29.59 .33	29.92 .33	30.25 .33	30.58 .33	30.91 .33	31.24 .33	31.56 .32	31.88 .32	32.19 .31	32.50 .31	32.81 .31
63°	29.36 .33	29.69 .33	30.03 .33	30.36 .33	30.69 .33	31.02 .32	31.34 .32	31.65 .32	31.97 .31	32.28 .31	32.59 .31
64°	29.14 .22	29.47 .22	29.81 .22	30.14 .22	30.47 .22	30.79 .22	31.11 .22	31.43 .22	31.75 .22	32.06 .22	32.36 .22
65°	28.92 .22	29.25 .22	29.59 .22	29.92 .22	30.25 .22	30.57 .22	30.89 .22	31.20 .22	31.52 .22	31.83 .22	32.14 .22
66°	28.70 .22	29.03 .22	29.37 .22	29.70 .22	30.02 .22	30.35 .22	30.67 .22	30.98 .22	31.30 .22	31.61 .22	31.92 .22
67°	28.49 .33	28.82 .33	29.15 .33	29.48 .33	29.80 .33	30.13 .32	30.45 .32	30.76 .31	31.08 .31	31.39 .31	31.69 .31
68°	28.27 .22	28.60 .22	28.93 .22	29.26 .22	29.58 .22	29.91 .22	30.23 .22	30.54 .22	30.86 .22	31.17 .22	31.47 .22
69°	28.05 .22	28.38 .22	28.71 .22	29.04 .22	29.36 .22	29.69 .22	30.01 .22	30.32 .22	30.64 .22	30.95 .22	31.25 .22
70°	27.84 .21	28.17 .21	28.49 .21	28.82 .21	29.14 .21	29.47 .21	29.79 .21	30.10 .21	30.41 .21	30.72 .21	31.03 .21
71°	27.62 .21	27.95 .21	28.28 .21	28.61 .21	28.93 .21	29.25 .21	29.57 .21	29.88 .21	30.19 .21	30.50 .21	30.81 .21
72°	27.41 .33	27.74 .32	28.08 .32	28.39 .32	28.71 .32	29.03 .32	29.35 .31	29.66 .31	29.97 .31	30.28 .31	30.59 .31
73°	27.19 .22	27.52 .22	27.84 .22	28.17 .22	28.49 .22	28.81 .22	29.13 .22	29.44 .22	29.75 .22	30.06 .22	30.37 .22
74°	26.98 .21	27.31 .21	27.63 .21	27.96 .21	28.28 .21	28.59 .21	28.91 .21	29.22 .21	29.53 .21	29.84 .21	30.15 .21
75°	26.77 .21	27.10 .21	27.43 .21	27.74 .21	28.06 .21	28.37 .21	28.69 .21	29.00 .21	29.31 .21	29.62 .21	29.93 .21
76°	26.57 .21	26.89 .21	27.21 .21	27.53 .21	27.85 .21	28.15 .21	28.47 .21	28.79 .21	29.10 .21	29.40 .21	29.70 .21
77°	26.36 .32	26.68 .32	27.00 .32	27.32 .32	27.64 .32	27.94 .31	28.26 .31	28.57 .31	28.88 .31	29.18 .30	29.48 .30
78°	26.15 .22	26.47 .22	26.78 .22	27.10 .22	27.42 .22	27.73 .22	28.04 .22	28.35 .22	28.66 .22	28.96 .22	29.26 .22
79°	25.94 .21	26.26 .21	26.57 .21	26.89 .21	27.20 .21	27.52 .21	27.83 .21	28.13 .21	28.44 .21	28.74 .21	29.04 .21
80°	25.73 .21	26.05 .21	26.36 .21	26.68 .21	26.99 .21	27.30 .21	27.61 .21	27.92 .21	28.22 .21	28.52 .21	28.82 .21
81°	25.52 .21	25.84 .21	26.15 .21	26.47 .21	26.77 .21	27.08 .21	27.39 .21	27.70 .21	28.00 .21	28.30 .21	28.60 .21
82°	25.31 .31	25.63 .31	25.94 .31	26.25 .31	26.56 .31	26.87 .30	27.17 .30	27.48 .30	27.78 .30	28.08 .30	28.38 .30
83°	25.10 .22	25.41 .22	25.72 .22	26.04 .22	26.34 .22	26.65 .22	26.96 .22	27.26 .22	27.56 .22	27.86 .22	28.16 .22
84°	24.89 .21	25.20 .21	25.51 .21	25.82 .21	26.13 .21	26.44 .21	26.74 .21	27.04 .21	27.34 .21	27.64 .21	27.94 .21
85°	24.68 .21	24.99 .21	25.30 .21	25.61 .21	25.91 .21	26.22 .21	26.52 .21	26.82 .21	27.12 .21	27.42 .21	27.72 .21
86°	24.47 .21	24.78 .21	25.09 .21	25.39 .21	25.70 .21	26.00 .21	26.30 .21	26.60 .21	26.90 .21	27.20 .21	27.49 .21
87°	24.26 .30	24.56 .30	24.88 .30	25.18 .30	25.48 .30	25.78 .30	26.08 .30	26.38 .30	26.68 .30	26.98 .30	27.27 .30
88°	24.05 .22	24.35 .22	24.66 .22	24.96 .22	25.26 .22	25.57 .22	25.87 .22	26.17 .22	26.47 .22	26.77 .22	27.07 .22
89°	23.84 .21	24.14 .21	24.45 .21	24.75 .21	25.05 .21	25.35 .21	25.65 .21	25.95 .21	26.25 .21	26.55 .21	26.85 .21
90°	23.62 .21	23.92 .21	24.23 .21	24.53 .21	24.83 .21	25.13 .21	25.43 .21	25.73 .21	26.03 .21	26.33 .21	26.63 .21



ALCOHOL TABLE—Continued.

Temper- ature, Fabr.	24.02	24.01	24.00	23.99	23.98	23.97	23.96	23.95	23.94	23.93	23.92
59°	33.79% 33.57	34.10% 33.88	34.40% 34.18	34.70% 34.48	35.00% 34.78	35.30% 35.08	35.59% 35.37	35.88% 35.66	36.17% 35.95	36.46% 36.24	36.74% 36.52
60°											
61°	33.35 33.12	33.65 33.43	33.95 33.73	34.25 34.03	34.55 34.32	34.85 34.62	35.14 34.91	35.43 35.21	35.72 35.50	36.01 35.79	36.29 36.07
62°											
63°	32.90 32.67	33.21 32.98	33.51 33.28	33.81 33.58	34.10 33.88	34.40 34.17	34.69 34.46	34.98 34.75	35.27 35.04	35.56 35.34	35.84 35.62
64°											
65°	32.45 32.22	32.76 32.53	33.06 32.83	33.36 33.13	33.66 33.43	33.95 33.72	34.24 34.02	34.53 34.31	34.82 34.60	35.11 34.88	35.39 35.17
66°											
67°	32.23 32.00	32.53 32.31	32.83 32.61	33.13 32.91	33.43 33.21	33.72 33.50	34.02 33.80	34.31 34.09	34.60 34.37	34.88 34.65	35.17 34.94
68°											
69°	31.78 31.56	32.09 31.86	32.39 32.16	32.69 32.46	32.98 32.76	33.27 33.05	33.57 33.35	33.86 33.64	34.15 33.92	34.43 34.20	34.72 34.49
70°											
71°	31.34 31.11	31.64 31.42	31.94 31.72	32.24 32.02	32.53 32.31	32.82 32.60	33.12 32.90	33.41 33.19	33.70 33.48	33.98 33.75	34.27 34.04
72°											
73°	30.89 30.67	31.19 30.97	31.49 31.27	31.79 31.57	32.09 31.86	32.38 32.15	32.67 32.45	32.96 32.74	33.25 33.03	33.53 33.31	33.82 33.60
74°											
75°	30.45 30.23	30.75 30.52	31.05 30.82	31.35 31.12	31.64 31.41	31.93 31.70	32.22 32.00	32.51 32.29	32.80 32.58	33.08 32.86	33.37 33.15
76°											
77°	30.00 29.78	30.30 30.08	30.60 30.38	30.90 30.68	31.19 30.97	31.48 31.26	31.77 31.55	32.06 31.84	32.35 32.13	32.63 32.41	32.92 32.70
78°											
79°	29.56 29.34	29.86 29.63	30.16 29.93	30.46 30.23	30.74 30.52	31.03 30.81	31.33 31.10	31.62 31.39	31.91 31.68	32.18 31.96	32.47 32.25
80°											
81°	29.12 28.90	29.41 29.19	29.71 29.49	30.01 29.79	30.30 30.08	30.59 30.37	30.88 30.66	31.17 30.95	31.45 31.23	31.74 31.52	32.02 31.80
82°											
83°	28.68 28.45	28.97 28.74	29.26 29.04	29.56 29.34	29.85 29.63	30.14 29.92	30.43 30.21	30.72 30.50	31.00 30.78	31.29 31.07	31.57 31.35
84°											
85°	28.23 28.01	28.52 28.30	28.81 28.59	29.11 28.89	29.40 29.18	29.69 29.47	29.98 29.76	30.27 30.05	30.55 30.33	30.84 30.62	31.12 30.90
86°											
87°	27.79 27.56	28.08 27.85	28.36 28.14	28.66 28.44	28.95 28.73	29.24 29.02	29.53 29.31	29.82 29.60	30.10 29.88	30.39 30.17	30.67 30.45
88°											
89°	27.34 27.11	27.63 27.40	27.91 27.69	28.21 27.99	28.50 28.28	28.79 28.57	29.08 28.86	29.37 29.15	29.65 29.43	29.94 29.72	30.22 30.00
90°											
	26.80 26.57	27.18 26.95	27.46 27.23	27.76 27.53	28.05 27.82	28.34 28.11	28.63 28.40	28.92 28.69	29.20 28.97	29.49 29.26	29.77 29.54

ALCOHOL TABLE—Continued.

Temper- ature, Fahr.	23.91	23.90	23.89	23.88	23.87	23.86	23.85	23.84	23.83	23.82	23.81
50°	37.02%	37.80%	37.58%	37.85%	38.13%	38.40%	38.67%	38.94%	39.20%	39.46%	39.73%
60°	36.79	37.07	37.35	37.62	37.90	38.17	38.44	38.71	38.98	39.24	39.51
61°	36.37	36.85	37.13	37.40	37.68	37.95	38.22	38.49	38.76	39.02	39.29
62°	36.35	36.63	36.91	37.18	37.46	37.73	38.00	38.27	38.53	38.79	39.06
63°	36.12	36.40	36.68	36.96	37.24	37.51	37.77	38.04	38.31	38.57	38.84
64°	35.90	36.18	36.46	36.73	37.01	37.28	37.55	37.82	38.09	38.35	38.62
65°	35.67	35.95	36.23	36.51	36.79	37.06	37.33	37.60	37.87	38.13	38.40
66°	35.45	35.73	36.01	36.29	36.57	36.83	37.10	37.38	37.65	37.91	38.18
67°	35.23	35.51	35.79	36.06	36.34	36.61	36.88	37.16	37.43	37.69	37.96
68°	35.00	35.28	35.56	35.84	36.12	36.39	36.66	36.93	37.20	37.46	37.73
69°	34.78	35.06	35.34	35.62	35.90	36.16	36.43	36.71	36.98	37.24	37.51
70°	34.55	34.83	35.11	35.39	35.67	35.94	36.21	36.49	36.76	37.02	37.29
71°	34.33	34.61	34.89	35.17	35.45	35.72	35.99	36.27	36.54	36.80	37.07
72°	34.11	34.39	34.67	34.95	35.22	35.49	35.76	36.04	36.31	36.58	36.85
73°	33.88	34.16	34.44	34.72	35.00	35.27	35.54	35.82	36.09	36.35	36.62
74°	33.66	33.94	34.22	34.50	34.78	35.05	35.32	35.59	35.86	36.13	36.40
75°	33.43	33.71	33.99	34.27	34.55	34.82	35.09	35.36	35.64	35.91	36.18
76°	33.21	33.49	33.77	34.05	34.33	34.60	34.87	35.14	35.42	35.69	35.96
77°	32.99	33.27	33.55	33.83	34.11	34.38	34.65	34.92	35.20	35.47	35.74
78°	32.76	33.04	33.32	33.60	33.88	34.15	34.42	34.69	34.97	35.24	35.52
79°	32.54	32.82	33.10	33.38	33.66	33.93	34.20	34.47	34.75	35.02	35.30
80°	32.31	32.59	32.87	33.15	33.43	33.71	33.98	34.25	34.53	34.80	35.07
81°	32.09	32.37	32.65	32.93	33.21	33.49	33.76	34.03	34.31	34.58	34.85
82°	31.86	32.14	32.42	32.70	32.98	33.26	33.53	33.80	34.08	34.36	34.63
83°	31.64	31.92	32.20	32.48	32.76	33.04	33.31	33.58	33.86	34.13	34.40
84°	31.41	31.69	31.97	32.25	32.53	32.81	33.08	33.35	33.63	33.91	34.18
85°	31.19	31.47	31.75	32.03	32.31	32.59	32.86	33.13	33.41	33.69	33.96
86°	30.96	31.24	31.52	31.80	32.08	32.36	32.63	32.90	33.18	33.46	33.74
87°	30.74	31.02	31.30	31.58	31.86	32.14	32.41	32.69	32.96	33.24	33.52
88°	30.52	30.79	31.07	31.35	31.63	31.91	32.18	32.45	32.73	33.01	33.29
89°	30.30	30.57	30.85	31.13	31.41	31.69	31.96	32.23	32.51	32.79	33.07
90°	30.08	30.34	30.62	30.90	31.18	31.46	31.73	32.00	32.28	32.57	32.85

ALCOHOL TABLE—Continued.

Temperature, Fahr.	23.80	23.70	23.78	23.77	23.76	23.75	23.74	23.73	23.72	23.71	23.70
59°	39.99% 39.77	40.24% 40.02	40.49% 40.27	40.75% 40.53	41.00% 40.78	41.26% 41.04	41.51% 41.29	41.76% 41.54	42.00% 41.78	42.25% 42.03	42.49% 42.27
60°	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
61°	39.55	39.80	40.05	40.31	40.56	40.82	41.07	41.32	41.56	41.81	42.05
62°	39.32	39.57	39.83	40.09	40.34	40.60	40.85	41.10	41.34	41.59	41.83
63°	39.10	39.35	39.61	39.87	40.12	40.38	40.63	40.88	41.12	41.37	41.61
64°	38.88	39.13	39.39	39.65	39.90	40.16	40.41	40.66	40.90	41.15	41.39
65°	38.66	38.91	39.17	39.43	39.68	39.94	40.19	40.44	40.68	40.93	41.17
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
66°	38.44	38.70	38.95	39.21	39.46	39.72	39.97	40.22	40.46	40.71	40.95
67°	38.22	38.48	38.73	38.99	39.24	39.50	39.75	40.00	40.24	40.49	40.73
68°	38.00	38.26	38.51	38.77	39.02	39.28	39.53	39.78	40.02	40.27	40.52
69°	37.78	38.04	38.29	38.55	38.80	39.06	39.31	39.56	39.80	40.05	40.30
70°	37.56	37.82	38.07	38.33	38.58	38.84	39.09	39.34	39.58	39.83	40.08
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
71°	37.33	37.59	37.85	38.11	38.36	38.62	38.87	39.12	39.36	39.61	39.86
72°	37.11	37.37	37.63	37.89	38.14	38.40	38.65	38.91	39.15	39.39	39.64
73°	36.89	37.15	37.41	37.67	37.92	38.18	38.43	38.69	38.93	39.18	39.43
74°	36.67	36.93	37.19	37.45	37.70	37.96	38.21	38.47	38.71	38.96	39.21
75°	36.45	36.71	36.97	37.23	37.48	37.74	38.00	38.24	38.49	38.74	38.99
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
76°	36.23	36.49	36.75	37.01	37.27	37.53	37.78	38.03	38.28	38.53	38.78
77°	36.01	36.27	36.53	36.79	37.05	37.31	37.55	37.81	38.06	38.31	38.56
78°	35.79	36.05	36.31	36.57	36.83	37.09	37.34	37.59	37.84	38.10	38.35
79°	35.57	35.83	36.09	36.35	36.61	36.87	37.12	37.37	37.62	37.88	38.13
80°	35.34	35.60	35.87	36.13	36.39	36.65	36.90	37.15	37.40	37.66	37.91
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
81°	35.12	35.38	35.65	35.91	36.17	36.43	36.68	36.93	37.18	37.44	37.69
82°	34.90	35.16	35.43	35.69	35.95	36.21	36.46	36.71	36.96	37.22	37.48
83°	34.67	34.94	35.21	35.47	35.73	35.99	36.25	36.50	36.75	37.01	37.26
84°	34.45	34.72	34.99	35.25	35.51	35.77	36.03	36.28	36.53	36.79	37.05
85°	34.23	34.50	34.77	35.03	35.29	35.55	35.81	36.06	36.31	36.57	36.83
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
86°	34.01	34.28	34.55	34.81	35.07	35.33	35.59	35.84	36.09	36.35	36.61
87°	33.79	34.06	34.33	34.59	34.85	35.11	35.37	35.62	35.87	36.13	36.40
88°	33.56	33.83	34.10	34.37	34.63	34.89	35.15	35.41	35.66	35.92	36.18
89°	33.34	33.61	33.88	34.15	34.41	34.67	34.93	35.19	35.44	35.70	35.97
90°	33.12	33.39	33.66	33.93	34.19	34.45	34.71	34.97	35.22	35.48	35.75

ALCOHOL TABLE—Continued.

Temper- ature, Fahr.	23.91	23.90	23.89	23.88	23.87	23.86	23.85	23.84	23.83	23.82	23.81
50°	37.02%	37.30%	37.58%	37.85%	38.13%	38.40%	38.67%	38.94%	39.20%	39.46%	39.73%
60°	36.70	37.07	37.35	37.62	37.90	38.17	38.44	38.71	38.98	39.24	39.51
61°	36.57	36.85	37.13	37.40	37.68	37.95	38.22	38.49	38.76	39.02	39.29
62°	36.35	36.63	36.91	37.18	37.46	37.73	38.00	38.27	38.53	38.79	39.06
63°	36.12	36.40	36.68	36.96	37.24	37.51	37.77	38.04	38.31	38.57	38.84
64°	35.90	36.18	36.46	36.73	37.01	37.28	37.55	37.82	38.09	38.35	38.62
65°	35.67	35.95	36.23	36.51	36.79	37.06	37.33	37.60	37.87	38.13	38.40
66°	35.45	35.73	36.01	36.29	36.57	36.83	37.10	37.38	37.65	37.91	38.18
67°	35.23	35.51	35.79	36.06	36.34	36.61	36.88	37.15	37.43	37.69	37.96
68°	35.00	35.28	35.56	35.84	36.12	36.39	36.66	36.93	37.20	37.46	37.73
69°	34.78	35.06	35.34	35.62	35.90	36.18	36.45	36.71	36.98	37.24	37.51
70°	34.56	34.83	35.11	35.39	35.67	35.94	36.21	36.49	36.76	37.02	37.29
71°	34.33	34.61	34.89	35.17	35.45	35.72	35.99	36.27	36.54	36.80	37.07
72°	34.11	34.39	34.67	34.95	35.23	35.50	35.78	36.04	36.31	36.58	36.85
73°	33.88	34.16	34.44	34.72	35.00	35.27	35.54	35.82	36.09	36.36	36.62
74°	33.66	33.94	34.22	34.50	34.78	35.05	35.32	35.59	35.86	36.13	36.40
75°	33.43	33.71	33.99	34.27	34.55	34.82	35.09	35.36	35.64	35.91	36.18
76°	33.21	33.49	33.77	34.05	34.33	34.60	34.87	35.14	35.42	35.69	35.96
77°	32.99	33.27	33.55	33.83	34.11	34.38	34.65	34.92	35.20	35.47	35.74
78°	32.76	33.04	33.32	33.60	33.88	34.15	34.42	34.69	34.97	35.24	35.52
79°	32.54	32.82	33.10	33.38	33.66	33.93	34.21	34.47	34.75	35.02	35.30
80°	32.31	32.59	32.87	33.15	33.43	33.71	33.98	34.25	34.53	34.80	35.07
81°	32.09	32.37	32.65	32.93	33.21	33.49	33.76	34.03	34.31	34.58	34.85
82°	31.86	32.14	32.42	32.70	32.98	33.26	33.53	33.80	34.08	34.36	34.63
83°	31.64	31.92	32.20	32.48	32.76	33.04	33.31	33.58	33.86	34.13	34.40
84°	31.41	31.69	31.97	32.25	32.53	32.81	33.08	33.36	33.63	33.91	34.18
85°	31.19	31.47	31.75	32.03	32.31	32.59	32.86	33.13	33.41	33.69	33.96
86°	30.96	31.24	31.52	31.80	32.08	32.36	32.63	32.90	33.18	33.46	33.74
87°	30.74	31.02	31.30	31.58	31.86	32.14	32.41	32.69	32.96	33.24	33.52
88°	30.51	30.79	31.07	31.35	31.63	31.91	32.18	32.45	32.73	33.01	33.29
89°	30.29	30.57	30.85	31.13	31.41	31.69	31.96	32.23	32.51	32.79	33.07
90°	30.06	30.34	30.62	30.90	31.18	31.46	31.73	32.00	32.28	32.57	32.85

ALCOHOL TABLE—Continued.

Temper- ature, Fahr.	23.80	23.79	23.78	23.77	23.76	23.75	23.74	23.73	23.72	23.71	23.70
59°	39.99%	40.24%	40.49%	40.75%	41.00%	41.26%	41.51%	41.76%	42.00%	42.25%	42.49%
60°	39.77	40.02	40.27	40.53	40.78	41.04	41.29	41.54	41.78	42.03	42.27
	.25	.25	.26	.26	.26	.26	.25	.25	.25	.25	.24
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
61°	39.55	39.80	40.05	40.31	40.56	40.82	41.07	41.32	41.56	41.81	42.05
62°	39.32	39.57	39.83	40.09	40.34	40.60	40.85	41.10	41.34	41.59	41.83
63°	39.10	39.35	39.61	39.87	40.12	40.38	40.63	40.88	41.12	41.37	41.61
64°	38.88	39.13	39.39	39.65	39.90	40.16	40.41	40.66	40.90	41.15	41.39
65°	38.66	38.91	39.17	39.43	39.68	39.94	40.19	40.44	40.68	40.93	41.17
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
66°	38.44	38.70	38.95	39.21	39.46	39.72	39.97	40.22	40.46	40.71	40.95
67°	38.22	38.48	38.73	38.99	39.24	39.50	39.75	40.00	40.24	40.49	40.73
68°	38.00	38.26	38.51	38.77	39.02	39.28	39.53	39.78	40.02	40.27	40.52
69°	37.78	38.04	38.29	38.55	38.80	39.06	39.31	39.56	39.80	40.05	40.30
70°	37.56	37.82	38.07	38.33	38.58	38.84	39.09	39.34	39.58	39.83	40.08
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
71°	37.33	37.59	37.85	38.11	38.36	38.62	38.87	39.12	39.36	39.61	39.86
72°	37.11	37.37	37.63	37.89	38.14	38.40	38.65	38.91	39.15	39.39	39.64
73°	36.89	37.15	37.41	37.67	37.92	38.18	38.43	38.69	38.93	39.18	39.43
74°	36.67	36.93	37.19	37.45	37.70	37.96	38.21	38.47	38.71	38.96	39.21
75°	36.45	36.71	36.97	37.23	37.48	37.74	37.99	38.24	38.49	38.74	38.99
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
76°	36.23	36.49	36.75	37.01	37.27	37.53	37.78	38.03	38.28	38.53	38.78
77°	36.01	36.27	36.53	36.79	37.05	37.31	37.55	37.81	38.06	38.31	38.56
78°	35.79	36.05	36.31	36.57	36.83	37.09	37.34	37.59	37.84	38.10	38.35
79°	35.57	35.83	36.09	36.35	36.61	36.87	37.12	37.37	37.62	37.88	38.13
80°	35.34	35.60	35.87	36.13	36.39	36.65	36.90	37.15	37.40	37.66	37.91
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
81°	35.12	35.38	35.65	35.91	36.17	36.43	36.68	36.93	37.18	37.44	37.69
82°	34.90	35.16	35.43	35.69	35.95	36.21	36.46	36.71	36.96	37.22	37.48
83°	34.67	34.94	35.21	35.47	35.73	35.99	36.25	36.50	36.75	37.01	37.26
84°	34.45	34.72	34.99	35.25	35.51	35.77	36.03	36.28	36.53	36.79	37.05
85°	34.23	34.50	34.77	35.03	35.29	35.55	35.81	36.06	36.31	36.57	36.83
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.21
86°	34.01	34.28	34.55	34.81	35.07	35.33	35.59	35.84	36.09	36.35	36.61
87°	33.79	34.06	34.33	34.59	34.85	35.11	35.37	35.62	35.87	36.13	36.40
88°	33.56	33.83	34.10	34.37	34.63	34.89	35.15	35.41	35.66	35.92	36.18
89°	33.34	33.61	33.88	34.15	34.41	34.67	34.93	35.19	35.44	35.70	35.97
90°	33.12	33.39	33.66	33.93	34.19	34.45	34.71	34.97	35.22	35.48	35.75

ALCOHOL TABLE—Continued.

Temper- ature, Fahr.	23.60	23.08	23.07	23.06	23.05	23.04	23.03	23.02	23.01	23.00	23.59
59°	42.73%	42.98%	43.22%	43.45%	43.69%	43.93%	44.16%	44.40%	44.63%	44.86%	45.09%
60°	42.51	42.76	43.00	43.23	43.47	43.71	43.94	44.18	44.41	44.64	44.87
	.22	.25	.22	.22	.22	.22	.22	.22	.22	.22	.22
61°	42.29	42.54	42.78	43.02	43.26	43.50	43.73	43.96	44.20	44.43	44.66
62°	42.07	42.32	42.56	42.80	43.04	43.28	43.51	43.75	43.98	44.21	44.44
63°	41.85	42.10	42.34	42.58	42.82	43.06	43.29	43.53	43.76	43.99	44.22
64°	41.63	41.88	42.12	42.36	42.60	42.84	43.07	43.31	43.55	43.78	44.01
65°	41.41	41.66	41.90	42.14	42.38	42.62	42.85	43.09	43.33	43.56	43.79
	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22	.22
66°	41.19	41.44	41.68	41.92	42.16	42.40	42.64	42.88	43.11	43.35	43.58
67°	40.97	41.22	41.46	41.71	41.95	42.19	42.42	42.66	42.89	43.13	43.36
68°	40.76	41.00	41.24	41.49	41.73	41.97	42.20	42.44	42.68	42.92	43.15
69°	40.54	40.79	41.03	41.27	41.51	41.75	41.99	42.23	42.46	42.70	42.93
70°	40.32	40.57	40.81	41.05	41.29	41.53	41.77	42.01	42.24	42.48	42.71
	.22	.22	.22	.21	.21	.21	.22	.22	.22	.22	.22
71°	40.10	40.35	40.59	40.84	41.08	41.32	41.56	41.80	42.03	42.27	42.50
72°	39.88	40.13	40.38	40.62	40.86	41.10	41.34	41.58	41.81	42.05	42.28
73°	39.67	39.92	40.16	40.41	40.65	40.89	41.12	41.36	41.60	41.84	42.07
74°	39.45	39.70	39.95	40.19	40.43	40.67	40.91	41.15	41.38	41.62	41.85
75°	39.23	39.48	39.73	39.98	40.22	40.46	40.69	40.93	41.16	41.40	41.63
	.22	.22	.21	.21	.21	.21	.21	.21	.21	.22	.22
76°	39.02	39.27	39.52	39.77	40.01	40.25	40.48	40.72	40.95	41.19	41.42
77°	38.81	39.06	39.30	39.55	39.79	40.03	40.26	40.50	40.73	40.97	41.20
78°	38.60	38.84	39.08	39.32	39.56	39.80	40.05	40.29	40.52	40.76	40.99
79°	38.38	38.62	38.87	39.12	39.36	39.60	39.83	40.07	40.31	40.54	40.77
80°	38.16	38.41	38.66	38.91	39.15	39.39	39.62	39.86	40.09	40.32	40.55
	.22	.22	.22	.21	.21	.21	.21	.22	.22	.22	.22
81°	37.94	38.19	38.44	38.69	38.94	39.18	39.41	39.64	39.87	40.10	40.33
82°	37.73	37.98	38.23	38.48	38.72	38.96	39.19	39.43	39.66	39.89	40.12
83°	37.51	37.76	38.01	38.26	38.51	38.75	38.98	39.21	39.44	39.67	39.90
84°	37.30	37.55	37.80	38.05	38.30	38.53	38.76	39.00	39.23	39.46	39.69
85°	37.08	37.33	37.58	37.83	38.08	38.32	38.55	38.78	39.01	39.24	39.47
	.22	.22	.22	.22	.21	.21	.21	.22	.22	.22	.22
86°	36.86	37.11	37.36	37.62	37.87	38.11	38.34	38.57	38.79	39.02	39.25
87°	36.65	36.90	37.15	37.40	37.65	37.89	38.12	38.35	38.58	38.81	39.04
88°	36.43	36.68	36.93	37.19	37.44	37.68	37.91	38.15	38.38	38.61	38.84
89°	36.22	36.47	36.72	36.97	37.22	37.46	37.69	37.93	38.16	38.39	38.62
90°	36.00	36.25	36.50	36.76	37.01	37.25	37.48	37.70	37.93	38.16	38.39

## ALCOHOL TABLE—Continued.

Temp't- ature, Fabr.	23.58	23.57	23.56	23.55	23.54	23.53	23.52	23.51	23.50	23.49	23.48
59°	45.31% 23	45.54% 23	45.77% 23	46.00% 23	46.22% 22	46.45% 23	46.67% 22	46.89% 22	47.11% 22	47.33% 22	47.54% 22
60°	45.10 21	45.33 21	45.56 21	45.79 21	46.01 21	46.24 21	46.46 21	46.68 21	46.90 21	47.12 21	47.33 21
61°	44.88 23	45.11 23	45.34 23	45.57 23	45.79 23	46.02 23	46.24 22	46.47 22	46.69 22	46.91 22	47.12 22
62°	44.67 23	44.90 23	45.13 23	45.36 23	45.58 23	45.81 23	46.03 22	46.25 22	46.47 22	46.69 22	46.91 22
63°	44.46 23	44.69 23	44.92 23	45.15 23	45.37 23	45.60 22	45.82 22	46.04 22	46.26 22	46.48 22	46.70 22
64°	44.24 23	44.47 23	44.70 23	44.93 23	45.15 23	45.38 22	45.61 22	45.83 22	46.05 22	46.27 22	46.49 22
65°	44.03 22	44.26 22	44.49 22	44.72 22	44.94 22	45.17 22	45.39 21	45.62 21	45.84 21	46.06 21	46.28 21
66°	43.81 22	44.04 22	44.27 22	44.50 22	44.72 22	44.95 21	45.17 21	45.40 21	45.62 21	45.84 21	46.06 21
67°	43.60 23	43.83 23	44.06 23	44.29 23	44.51 23	44.74 23	44.96 23	45.19 22	45.41 22	45.63 22	45.85 22
68°	43.38 23	43.61 23	43.84 23	44.07 23	44.29 23	44.52 23	44.75 23	44.98 22	45.20 22	45.42 22	45.64 22
69°	43.16 22	43.39 22	43.63 22	43.86 22	44.08 22	44.31 21	44.54 21	44.77 21	44.99 21	45.21 21	45.43 21
70°	42.95 22	43.18 22	43.41 22	43.64 22	43.86 21	44.09 21	44.32 21	44.55 21	44.77 21	44.99 21	45.21 21
71°	42.73 22	42.96 22	43.20 22	43.43 22	43.65 22	43.88 22	44.11 22	44.34 22	44.56 22	44.78 22	45.00 22
72°	42.52 23	42.75 23	42.98 23	43.21 23	43.44 23	43.67 23	43.90 23	44.13 22	44.35 22	44.57 22	44.79 22
73°	42.30 23	42.53 23	42.77 23	43.00 23	43.23 23	43.46 23	43.69 23	43.92 22	44.14 22	44.36 22	44.58 22
74°	42.08 22	42.31 22	42.55 22	42.78 22	43.01 22	43.24 22	43.47 22	43.70 22	43.92 22	44.14 22	44.36 22
75°	41.87 22	42.10 22	42.34 22	42.57 22	42.80 22	43.03 22	43.26 22	43.49 22	43.71 22	43.93 22	44.15 22
76°	41.65 22	41.88 22	42.12 22	42.35 22	42.58 22	42.81 22	43.04 22	43.26 22	43.49 22	43.71 22	43.94 22
77°	41.43 23	41.66 23	41.90 23	42.13 23	42.36 23	42.59 23	42.82 23	43.04 23	43.27 23	43.49 23	43.72 23
78°	41.22 23	41.45 23	41.69 23	41.92 23	42.15 23	42.38 23	42.61 22	42.83 22	43.06 22	43.28 22	43.51 22
79°	41.00 22	41.23 22	41.47 22	41.70 22	41.93 22	42.16 22	42.39 22	42.61 22	42.84 22	43.07 22	43.29 22
80°	40.78 22	41.01 22	41.25 22	41.48 22	41.71 22	41.94 22	42.17 22	42.39 22	42.62 22	42.85 22	43.08 22
81°	40.56 22	40.79 22	41.03 22	41.26 22	41.49 22	41.72 22	41.95 22	42.17 22	42.40 22	42.63 22	42.87 22
82°	40.34 23	40.57 23	40.81 23	41.04 23	41.27 23	41.50 23	41.74 23	41.96 23	42.19 23	42.42 23	42.65 23
83°	40.13 23	40.36 23	40.60 23	40.83 23	41.06 23	41.29 23	41.52 22	41.74 23	41.97 23	42.20 23	42.44 23
84°	39.91 22	40.14 22	40.38 22	40.61 22	40.84 22	41.07 22	41.30 22	41.53 22	41.76 22	41.99 22	42.22 22
85°	39.69 22	39.92 22	40.16 22	40.39 22	40.62 22	40.85 22	41.08 22	41.31 22	41.54 22	41.77 22	42.01 22
86°	39.47 22	39.70 22	39.94 22	40.17 22	40.40 22	40.63 22	40.86 22	41.09 22	41.32 22	41.55 22	41.79 22
87°	39.26 23	39.49 23	39.72 23	39.95 23	40.18 23	40.41 23	40.65 23	40.88 23	41.11 23	41.34 23	41.58 23
88°	39.04 23	39.27 23	39.51 23	39.74 23	39.97 23	40.20 23	40.43 23	40.66 23	40.89 23	41.12 23	41.36 23
89°	38.83 22	39.06 22	39.29 22	39.52 22	39.75 22	39.98 22	40.22 22	40.45 22	40.68 22	40.91 22	41.15 22
90°	38.61 22	38.84 22	39.07 22	39.30 22	39.53 22	39.76 22	40.00 22	40.23 22	40.46 22	40.69 22	40.93 22

ALCOHOL TABLE—Continued.

Temper- ature, Fahr.	23.47	23.46	23.45	23.44	23.43	23.42	23.41	23.40	23.39	23.38	23.37
59°	47.76% 21	47.97% 22	48.19% 21	48.40% 21	48.61% 21	48.82% 21	49.03% 21	49.25% 21	49.46% 21	49.67% 21	49.87% 21
60°	47.55% 21	47.76% 22	47.98% 21	48.19% 21	48.40% 21	48.61% 21	48.82% 21	49.04% 21	49.25% 21	49.46% 21	49.66% 21
61°	47.34% 21	47.55% 22	47.77% 21	47.98% 21	48.19% 21	48.40% 21	48.61% 21	48.83% 21	49.04% 21	49.25% 21	49.46% 21
62°	47.13% 21	47.34% 22	47.56% 21	47.77% 21	47.98% 21	48.20% 21	48.40% 21	48.62% 21	48.83% 21	49.04% 21	49.25% 21
63°	46.92% 21	47.13% 22	47.35% 21	47.56% 21	47.77% 21	47.99% 21	48.20% 21	48.42% 21	48.63% 21	48.84% 21	49.04% 21
64°	46.71% 21	46.92% 22	47.14% 21	47.35% 21	47.56% 21	47.78% 21	47.99% 21	48.21% 21	48.42% 21	48.63% 21	48.84% 21
65°	46.50% 21	46.71% 22	46.93% 21	47.14% 21	47.36% 21	47.57% 21	47.78% 21	48.00% 21	48.21% 21	48.42% 21	48.63% 21
66°	46.28% 21	46.50% 22	46.72% 21	46.93% 21	47.15% 21	47.37% 21	47.58% 21	47.79% 21	48.00% 21	48.21% 21	48.42% 21
67°	46.07% 21	46.28% 22	46.51% 21	46.72% 21	46.94% 21	47.16% 21	47.37% 21	47.58% 21	47.79% 21	48.00% 21	48.21% 21
68°	45.86% 21	46.08% 22	46.30% 21	46.51% 21	46.73% 21	46.95% 21	47.16% 21	47.37% 21	47.58% 21	47.79% 21	48.00% 21
69°	45.65% 21	45.87% 22	46.09% 21	46.31% 21	46.53% 21	46.74% 21	46.96% 21	47.17% 21	47.38% 21	47.59% 21	47.80% 21
70°	45.43% 21	45.65% 22	45.87% 21	46.09% 21	46.31% 21	46.53% 21	46.74% 21	46.96% 21	47.17% 21	47.38% 21	47.59% 21
71°	45.22% 21	45.44% 22	45.66% 21	45.88% 21	46.10% 21	46.32% 21	46.53% 21	46.75% 21	46.96% 21	47.17% 21	47.38% 21
72°	45.01% 21	45.23% 22	45.45% 21	45.67% 21	45.89% 21	46.11% 21	46.32% 21	46.54% 21	46.75% 21	46.96% 21	47.17% 21
73°	44.80% 21	45.02% 22	45.24% 21	45.46% 21	45.68% 21	45.90% 21	46.11% 21	46.33% 21	46.54% 21	46.75% 21	46.96% 21
74°	44.58% 21	44.81% 22	45.03% 21	45.25% 21	45.47% 21	45.69% 21	45.90% 21	46.12% 21	46.33% 21	46.54% 21	46.75% 21
75°	44.37% 21	44.60% 22	44.82% 21	45.04% 21	45.26% 21	45.48% 21	45.69% 21	45.91% 21	46.12% 21	46.33% 21	46.54% 21
76°	44.16% 21	44.39% 22	44.61% 21	44.83% 21	45.05% 21	45.27% 21	45.48% 21	45.70% 21	45.91% 21	46.12% 21	46.33% 21
77°	43.94% 21	44.17% 22	44.39% 21	44.61% 21	44.84% 21	45.06% 21	45.27% 21	45.49% 21	45.70% 21	45.91% 21	46.12% 21
78°	43.73% 21	43.96% 22	44.18% 21	44.40% 21	44.62% 21	44.84% 21	45.06% 21	45.28% 21	45.49% 21	45.70% 21	45.91% 21
79°	43.52% 21	43.75% 22	43.97% 21	44.19% 21	44.41% 21	44.63% 21	44.85% 21	45.07% 21	45.28% 21	45.49% 21	45.70% 21
80°	43.31% 21	43.54% 22	43.76% 21	43.98% 21	44.20% 21	44.42% 21	44.64% 21	44.86% 21	45.07% 21	45.28% 21	45.49% 21
81°	43.10% 21	43.33% 22	43.55% 21	43.77% 21	43.99% 21	44.21% 21	44.43% 21	44.65% 21	44.87% 21	45.09% 21	45.30% 21
82°	42.88% 21	43.11% 22	43.34% 21	43.56% 21	43.78% 21	44.00% 21	44.22% 21	44.44% 21	44.66% 21	44.88% 21	45.09% 21
83°	42.67% 21	42.90% 22	43.12% 21	43.34% 21	43.56% 21	43.78% 21	44.01% 21	44.23% 21	44.45% 21	44.67% 21	44.88% 21
84°	42.45% 21	42.68% 22	42.91% 21	43.13% 21	43.35% 21	43.57% 21	43.80% 21	44.02% 21	44.24% 21	44.46% 21	44.67% 21
85°	42.24% 21	42.47% 22	42.70% 21	42.92% 21	43.14% 21	43.36% 21	43.59% 21	43.81% 21	44.03% 21	44.25% 21	44.46% 21
86°	42.03% 21	42.26% 22	42.49% 21	42.71% 21	42.93% 21	43.15% 21	43.38% 21	43.60% 21	43.82% 21	44.04% 21	44.25% 21
87°	41.81% 21	42.04% 22	42.27% 21	42.50% 21	42.72% 21	42.94% 21	43.17% 21	43.39% 21	43.61% 21	43.83% 21	44.04% 21
88°	41.60% 21	41.83% 22	42.06% 21	42.28% 21	42.50% 21	42.72% 21	42.95% 21	43.17% 21	43.40% 21	43.62% 21	43.83% 21
89°	41.39% 21	41.61% 22	41.84% 21	42.07% 21	42.29% 21	42.51% 21	42.73% 21	42.95% 21	43.17% 21	43.40% 21	43.62% 21
90°	41.17% 21	41.40% 22	41.63% 21	41.86% 21	42.08% 21	42.30% 21	42.53% 21	42.75% 21	42.98% 21	43.20% 21	43.43% 21



ALCOHOL TABLE—Continued.

Temper- ature, Fahr.	23.36	23.35	23.34	23.33	23.32	23.31	23.30	23.29	23.28	23.27	23.26
59°	50.08%	50.29%									
60°	49.87	50.08									
61°	49.66	49.87	50.08	50.28	50.49						
62°	49.46	49.67	49.88	50.08	50.28						
63°	49.25	49.46	49.67	49.87	50.08	50.29	50.28				
64°	49.04	49.25	49.46	49.66	49.87	50.08	50.07				
65°	48.84	49.05	49.26	49.46	49.67	49.87					
66°	48.63	48.84	49.05	49.25	49.46	49.67	49.87	50.07	50.28	50.48	
67°	48.42	48.63	48.84	49.04	49.25	49.46	49.66	49.86	50.07	50.27	
68°	48.21	48.42	48.63	48.84	49.05	49.26	49.46	49.66	49.87	50.07	50.27
69°	48.01	48.22	48.43	48.63	48.84	49.05	49.25	49.45	49.66	49.86	50.07
70°	47.80	48.01	48.22	48.42	48.63	48.84	49.04	49.24	49.46	49.66	49.87
71°	47.59	47.80	48.01	48.21	48.42	48.63	48.84	49.04	49.25	49.45	49.66
72°	47.38	47.59	47.80	48.01	48.21	48.42	48.63	48.83	49.04	49.25	49.46
73°	47.18	47.39	47.60	47.80	48.01	48.22	48.43	48.63	48.84	49.05	49.26
74°	46.97	47.18	47.39	47.59	47.80	48.01	48.22	48.42	48.63	48.84	49.05
75°	46.76	46.97	47.18	47.39	47.60	47.81	48.02	48.22	48.43	48.63	48.84
76°	46.55	46.76	46.97	47.18	47.39	47.60	47.81	48.02	48.23	48.43	48.64
77°	46.34	46.55	46.76	46.97	47.18	47.39	47.60	47.81	48.02	48.23	48.44
78°	46.14	46.35	46.56	46.77	46.98	47.19	47.40	47.61	47.82	48.03	48.24
79°	45.93	46.14	46.35	46.56	46.77	46.98	47.19	47.40	47.61	47.82	48.03
80°	45.72	45.93	46.14	46.35	46.56	46.78	46.99	47.20	47.41	47.62	47.83
81°	45.51	45.72	45.93	46.14	46.35	46.57	46.78	46.99	47.20	47.42	47.63
82°	45.30	45.51	45.72	45.93	46.14	46.36	46.58	46.79	47.00	47.21	47.42
83°	45.10	45.31	45.52	45.73	45.94	46.16	46.37	46.58	46.79	47.01	47.22
84°	44.89	45.10	45.31	45.52	45.73	45.95	46.17	46.38	46.59	46.80	47.01
85°	44.68	44.89	45.10	45.31	45.52	45.74	45.96	46.17	46.38	46.60	46.81
86°	44.47	44.68	44.89	45.10	45.31	45.53	45.75	45.96	46.18	46.39	46.60
87°	44.26	44.47	44.68	44.89	45.10	45.32	45.55	45.76	45.97	46.19	46.40
88°	44.06	44.27	44.48	44.69	44.90	45.12	45.34	45.56	45.78	45.99	46.20
89°	43.85	44.06	44.27	44.48	44.69	44.92	45.14	45.35	45.57	45.78	45.99
90°	43.64	43.85	44.06	44.27	44.49	44.71	44.93	45.14	45.36	45.58	45.79

ALCOHOL TABLE—Continued.

Temperature, Fahr.	23.25	23.24	23.23	23.22	23.21	23.20	23.19	23.18	23.17	23.16	23.15
50°											
60°											
61°											
62°											
63°											
64°											
65°											
66°											
67°											
68°											
69°											
70°	50.07										
	.80										
71°	40.86	50.06	50.26	50.46							
72°	40.86	40.86	50.06	50.26							
73°	40.15	.20	40.85	50.05	50.25						
74°	40.25	40.45	40.65	40.85	50.05						
75°	40.05	40.25	40.45	40.65	40.85	50.05					
	.80	.80	.80	.21	.21	.80					
76°	40.84	40.04	40.24	40.44	40.64	40.84	50.04				
77°	40.04	40.24	40.44	40.64	40.84	40.04	50.04				
78°	40.83	40.03	40.23	40.43	40.63	40.83	40.03	50.03			
79°	40.03	40.23	40.43	40.63	40.83	40.03	50.03	50.23	50.43	50.63	50.83
80°	40.03	40.23	40.43	40.63	40.83	40.03	50.03	50.23	50.43	50.63	50.83
	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20
81°	47.63	48.03	48.23	48.43	48.63	48.83	49.03	49.23	49.43	49.63	49.83
82°	47.62	47.82	48.02	48.22	48.42	48.62	48.82	49.02	49.22	49.42	49.62
83°	47.42	47.62	47.82	48.02	48.22	48.42	48.62	48.82	49.02	49.22	49.42
84°	47.21	47.41	47.61	47.81	48.01	48.21	48.41	48.61	48.81	49.01	49.21
85°	47.01	47.21	47.41	47.61	47.81	48.01	48.21	48.41	48.61	48.81	49.01
	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20
86°	46.80	47.01	47.22	47.42	47.62	47.82	48.02	48.22	48.42	48.62	48.82
87°	46.60	46.80	47.01	47.21	47.41	47.61	47.81	48.01	48.21	48.41	48.61
88°	46.40	46.60	46.81	47.01	47.21	47.41	47.61	47.81	48.01	48.21	48.41
89°	46.20	46.40	46.61	46.81	47.01	47.21	47.41	47.61	47.81	48.01	48.21
90°	46.00	46.20	46.41	46.61	46.81	47.01	47.21	47.41	47.61	47.81	48.01

## ALCOHOL TABLE—Continued.

Temperature, Fahr.	23.14	23.15	23.12	23.11	23.10	23.09	23.07	23.06	23.05
59°									
60°									
61°									
62°									
63°									
64°									
65°									
66°									
67°									
68°									
69°									
70°									
71°									
72°									
73°									
74°									
75°									
76°									
77°									
78°									
79°									
80°									
81°	.20	.20							
82°	50.05	50.25							
83°	49.85	50.05							
84°	49.65	49.85	.20	50.25	.20				
85°	49.45	49.65		50.05	50.25				
86°	49.25	49.45		49.85					
87°	.20	.20		.20	.20				
88°	49.05	49.25	49.45	49.65	49.85	50.05	50.25		
89°	48.85	49.05	49.25	49.45	49.65	49.85	50.05	.20	
90°	48.65	48.85	.20	49.25	49.45	49.65	50.05	50.25	.20
91°	48.45	48.65		49.05	49.25	49.45	49.65	50.05	50.25
92°	48.25			48.85	49.05	49.25	49.45	49.65	50.05

The Chair stated that there were still two papers left, one by Messrs. Kebler and Chestnut, of Washington City, on the subject of "The National Museum in Drug Research;" the other a paper by Mr. L. D. Havenhill, on "The Desirability of More Elaborate Pharmacopœial Standards." He said the paper of Mr. Kebler had appeared too late for publication, and also had not been received in time to be put in the printed program. He called attention to the fact that the hour was now 25 minutes to six, and suggested an adjournment to the conference-room (because the assembly hall had to be arranged for another purpose), so that Mr. Havenhill and Mr. Kebler might have opportunity to give abstracts of their papers. The Chair also called attention to a paper by himself and Mr. Bernegau on the "Interference of Sodium Bicarbonate in the testing of Pancreatin."

Mr. Hallberg moved that the "Alcohol Table" of Mr. Lyons be referred to the Committee on United States Pharmacopœia, instead of being published in the Proceedings. Chairman Vanderkleed suggested, however, that it would be well to let the paper take the usual course, and then it could be referred to the Committee on U. S. P., if considered desirable. He thought the paper would be a very fine addition to the Proceedings. And so the matter was passed.

An adjournment was here taken to the conference room as suggested by the Chair.

The Chair called on Mr. Havenhill to present his paper on Pharmacopœial Standards, which he did as follows:

#### THE DESIRABILITY OF MORE ELABORATE PHARMACOPŒIAL STANDARDS.

BY L. D. HAVENHILL.

The primary aim of the U. S. P. and N. F. is to provide the physician with armament of drugs and medicines of standard quality. The first step to secure this was to provide titles, definitions and descriptions for crude drugs, and approved formulas for preparing medicines from them. It is, however, perfectly obvious from the knowledge we possess at the present time concerning crude drugs, that if these medicines are to approach a satisfactory degree of uniformity, something additional is necessary. The drug itself, as well as the preparations therefrom, should be standardized. In the case of chemicals, which are very often administered *per se*, we have, in most instances, very elaborate directions in the U. S. P. for ascertaining their fitness for medical use; but in the case of the vegetable substances not chemically standardized, aside from the very comprehensive descriptions necessary to establish the identity of the crude substances, the tests for establishing their fitness for the preparation of medicines are very meagre. Since nature is being taxed to a much greater extent than formerly to furnish these drugs, it is but natural to expect that

less care will be exercised in their selection, and that their quality is likely to continue to grow less and less uniform.

The fact that the vegetable drugs are of variable quality has already been recognized, and the number of assay processes has been greatly increased in the eighth revision of the U. S. P. In these assays a minimum limit for active alkaloidal constituents has in most cases been considered sufficient for the drug, but the fluidextract and the tincture from these have been still further standardized and brought to a definite alkaloidal content. The great variability of the alkaloidal content in different lots of the same drug is, however, in many instances, so great as to cause a marked difference in the physical appearance of the resulting preparations of these lots, and one may well question, for example, whether two fluid-extracts of coca can be considered therapeutically equivalent when one is made from a drug which assays 0.5 per cent. and the other from a drug which assays more than 1.0 per cent. of ether-soluble alkaloids. The fact that these preparations are of uniform alkaloidal strength is of the greatest importance to the theoretical therapist, but they are still often unsatisfactory to the pharmacist and the practitioner.

If we admit that the influence of the mind over the body is capable of modifying the functions of its organs, then we must admit that in order for the physician to get the best results from his medicines he must be provided with remedies which are not only of uniform potency but of uniform appearance and compatibilities. In our desire to secure this uniform potency we must not lose sight of the helpful influence of these latter. I do not in any way wish to be understood as decrying the desirability of alkaloidal standardization, but I do wish to emphasize that we need more standards for both the drugs and the medicines prepared from them. Standards for ash, extractive and color are in my opinion of far more importance than is generally admitted. They are also of particular concern to the pharmacist who is so often called to stand between the highly educated physician on one hand and the less educated but more impressionable public on the other.

The variable quality of the non-alkaloidal drugs and especially when powdered makes it particularly desirable to have some method of standardization. This need becomes the more apparent when one stops to consider that the crude drugs are gradually disappearing from our stores and that their places are taken by the powdered article for which the pharmacopœia provides no method whereby the pharmacist can judge of their quality. The variation in ash, extractive and color for drugs of apparently good quality is very great and therefore it is desirable to allow broad limits in the standards, but standards should be provided which would aid the pharmacist in eliminating the inferior products and enable him to furnish a standard line of preparations. A few examples and figures chosen at random will serve to show the necessity for this. The

ash of anise is about 6.0 per cent., yet the powdered anise of the market and often the whole sample yields from 15 to 30.0 per cent. of ash. The ash of taraxacum is about 7.0 per cent., yet the inorganic matter reported in this drug has been as high as 48.0 per cent. The official colocynth is the peeled fruit deprived of the seeds, in other words the pulp. Much of the powdered colocynth furnished the pharmacist, regardless of his specifications, contains the seeds. For this drug a limit for petroleum ether soluble matter is desired and a colocynthin assay would be very acceptable. There is on the market powdered extract of liquorice which meets the present official requirement of 60.0 per cent. of soluble matter, yet it contains but a very small amount of the sweet principle. The nature of the solvent directed in this test should be changed but an assay process for glycyrrhizin would be equally desirable. Powdered glycyrrhiza is also often found deficient in the characteristic principle. This drug enters into the composition of so many of the official preparations that it is from a pharmaceutical standpoint a very important one. Siam and Sumatra benzoin though both are official as benzoin vary greatly in price and also in their yield of resinous water. Siam benzoin usually yields about 98.0 per cent. of alcohol-soluble matter while the Sumatra variety frequently yields less than 60.0 per cent. The ash of rhubarb ranges from 4 to 40.0 per cent.; the color of the powder is also quite variable. The water-soluble matter ranges from 20 to 45.0 per cent., and the activity probably varies proportionately. This list could be materially extended but the few examples cited will serve to show that there is a very great variation in the quality of the non-alkaloidal drugs entering the official preparations.

Since as has been shown neither nature nor art is producing drugs of uniform quality, it is very desirable that the next committees of revision of our national drug standards should not only provide tests for determining the fitness of drugs for medical use, but also fix such standards for the numerous preparations as will enable pharmacists to supply a complete line which shall be therapeutically and pharmaceutically standard.

The Chair called for discussion on the paper just read.

Mr. Francis said this was a splendid paper contributed by the gentleman. He said he had brought out some practical points that every retailer and every manufacturer needs in his business, but as to the technical point, the objection to fluidextracts that at one time may be green and another a brownish-green, the question is, how shall the retailer or the manufacturing pharmacist whose fluidextracts may be otherwise all right, adjust them to the standard proposed? Is he to use aniline dyes, or what? The drug market is in such a condition that it is impossible to purchase drugs of standard color.

Mr Charles E. Caspari suggested that the therapeutic value of these

extracts does not depend upon color, and asked why they should have color. Mr. Havenhill said that there were many of these points that were very difficult of solution, especially as to standardization with reference to color, but he was of opinion that they could be overcome by a sufficient amount of research. The probabilities are that some artificial color might be used: it is not necessary to be an aniline dye, other colors might be added. It was very desirable in medical preparations that the medicine should have a uniform appearance. The value of a drug is perhaps too often judged by its physical appearance, and he believed that to excite in the mind of the physician, or the mind of the patient, any degree of skepticism with regards to the medicines furnished would probably very greatly hinder or interfere with the therapeutic action of the drug. Just how great that might be, was of course a question not scientifically decided as yet. More attention, he thought, should be paid to that.

Mr. Osseward, speaking upon the color proposition, said he thought it was quite an important thing that given preparations should all be the same in that respect. He gave an illustration of preparing some suppositories for a patient that proved satisfactory, but when he came in to have the prescription refilled, the old jar from which the first prescription was filled was out, and he had opened up a new jar, which was of a brownish color, differing from the first. He had taken it for granted that it was all right, and the prescription was accordingly prepared; but the patient came back and said they were not the same thing at all. He knew they were using the same fluid extract; of course, and it was simply a variation in colors, but the question was how to convince the patient of this fact. In cases like this it is very desirable to have the same color.

Mr. Francis asked Mr. Osseward what he did to obviate this difficulty. Mr. Osseward replied that he explained to the physician that he had used a new jar as the first one was out. He opened up a third jar and that it was green. Of course he explained that, so far as the medicinal effect was concerned, that was exactly the same.

The Chairman thought that this question of variance in color was one that might be explained to the physician, if not to the general public, because it was well known that colors in a thing of that kind are of very little or of no value in determining the strength or value of the preparation.

Mr. Osseward asked the Chairman if he had ever attempted to make such explanation to the patient. Mr. Vanderkleed replied that it might be a difficult matter to educate the public up to that point.

Continuing, Mr. Vanderkleed said he believed that the matter of standardization along the lines suggested in the paper was something for the far-distant future to settle. He believed that when pharmacists have succeeded in getting their preparations and drugs standardized as to therapeutic value, as now determined by the active principles therein contained, a great deal will have been accomplished; and, after securing that point,

then there would be plenty of time for taking up standardization along other lines. But by the time this condition is reached the public will probably have learned that a variation in color makes no difference in the value of the drug, and pharmacists will be saved trouble upon this point.

Mr. Edward Kremers suggested that if the matter of the raising and procuring of drugs was in intelligent and skilful hands—left in the hands of such persons instead of the ignorant—the subject of standardization would settle itself, because there would be no trouble in getting drugs of the proper standard.

The Chair said that this point had been brought out in the papers of the early morning, it being suggested that the question of drug cultivation was one that would certainly be a solution of many of the difficulties now existing. It has been pointed out by Mr. Kebler that if we could improve the quality of our herds of cattle and fields of oats by breeding and cultivation, the same thing is possible for drugs. The government was taking up that work very extensively now, he said, and more might be expected to be heard from that in the near future.

Mr. Charles E. Caspary said he did not ask the question in a spirit of criticism, but because there seemed to be something more behind it than the mere ignorance of the physician and the public. Mr. Havenhill had said there was a good deal more behind that. He did not think, however, that the Pharmacopœia was the place to introduce color standards for galenicals. He believed the question of standardization had a decided bearing on the relationship between the physician and pharmacist and the public. A patient comes in and notices the difference and he shows it to the physician, and it takes time to explain to the physician and to the patient. The fact is, the patient is never fully convinced after having once become dissatisfied; after that, he is ready to make trouble with the physician, and then the physician comes to the pharmacist, and he had some doubt in his own mind as to whether even the physician is ever fully convinced. When things on their face are apparently different, it is hard to convince a man that they are the same. And so the physician finally says, "What is the use of all this bother? The way of the least resistance is to furnish my own medicines." And then the matter is taken entirely out of the hands of the patient, and he has no reason to become suspicious in any way.

Mr. Kebler called attention to a practical feature that he had heard of last year: A member from Memphis, Tenn., said that they had been trying to get the doctors and druggists there together, and they had a very excellent meeting, and that the doctors were very much pleased with the attitude of the druggists. But a question that came up was this: Suppose we prescribe for our patients N. F. and U. S. P. products, how do we know that we are going to get the same products wherever dispensed? The druggists got together and decided on the use of the same product all



the time, in ten different drug stores, and the satisfactory result there obtained was indicated by the fact that the use of nostrums had been decreasing at the rate of ten per cent. per month.

The Chair called on Mr. Kebler to give a resumé of his article on the National Museum in Drug Research. Mr. Kebler abstracted his paper, the full text thereof being as follows :

#### THE NATIONAL MUSEUM IN DRUG RESEARCH.

BY LYMAN F. KEBLER AND V. K. CHESTNUT,

Division of Drugs, Bureau of Chemistry, U. S. Department of Agriculture.

The United States National Museum was founded in 1840, when Hon. Joel Robert Poinsett, of South Carolina, Secretary of War under Van Buren, organized a society called the "National Institution," whose object was the formation of a museum at Washington. The society's collection, known as the "National Cabinet of Curiosities," was deposited first in the Patent Office, but was turned over in 1858 to the Smithsonian Institution, when the name "National Museum" was used unofficially to designate the collection placed in the Smithsonian building. Before 1876, however, no money was appropriated by Congress for the purchase of specimens, and it was not until some of the rich treasure of about thirty different foreign nations exhibited in 1876 at the Centennial Exposition at Philadelphia was donated to the government, that Congress was induced to provide the present quarters for the museum.

It was in these gifts from foreign nations, especially China, that the drug collection had its origin. Since then, especially for the first one and one-half decades, when all available space was occupied, its growth was very rapid. The accessions on July 1, 1908, numbered 7,158. All of the specimens are well labeled and catalogued, and the collection as thus put together serves admirably as a basis for research work. As each of the three natural kingdoms is drawn upon for drugs, there is no great branch of the Museum collections which does not represent drug material in some way or other. The principal departments in which the study of drugs may be pursued, are, however, the drug collection mentioned above, and the National Herbarium, which now contains about a million specimens, and is growing at the very rapid rate of about 40,000 specimens per year. The Museum Library, although not in itself rich in pharmaceutical literature, contains a full set of the pharmacopœias of all nations, and a great many botanical works. It is further strengthened, of course, by its extensive affiliations with other government libraries, especially the Library of Congress, the Agricultural Department Library, and the admirably indexed library of the Surgeon-General of the Navy, one of the best medical libraries of the world.

Drug investigations fall naturally into three groups, botanical, chemical and pharmacological. It is the duty of the botanist through comparison

and study of specimens collected in the field or found in different herbaria, to so describe the microscopic and gross anatomy of a plant or drug that it may be clearly distinguished from other similar species which may or may not possess the same botanical constituents. He may also give an account of the habit and habitat of the plant, name the locality where the type specimen was taken, and then very carefully preserve the type for future inspection, perhaps 200 years hence. In addition to this, in the study of crude drugs, notes should be included, giving full particulars relative to the physical properties of the drug, its behavior under simple manipulation towards solvents and a few reagents, and a careful account of its preparation for, and its route of shipment into commerce. The duty of the chemical investigator or phyto-chemist is not only to isolate the active constituents of plants, but to determine their constitution, their relative proportions in the plant, how the percentages vary in different parts or in different conditions and stages of growth, and, finally, the best and quickest methods for their detection, separation and estimation. The pharmacologist has to determine by physiological and chemical investigation, often by the use of instruments of precision, the particular effects which different quantities of a drug exert upon the various fluids and organs of the body. If the substance is poisonous he must also determine the limits of safe dosage and the best antidote and means of offsetting its effect on the body. Of these three main classes of drug research only the first, and that only in part, has ever been carried out by the museum. An attempt was made, however, in 1884, by Dr. H. G. Beyer, then temporarily in charge of the drug collection, to induce the higher museum officials to make appropriations for the investigation, chemically and pharmacologically, of some of the interesting drugs then in his charge, but it was unsuccessful. This appeal, although noted in our other paper entitled, "The Drug Collection at Washington," is worth quoting in this connection, because Dr. Beyer appears to have been the first person clearly to recognize the importance, to the government, of the work of the pharmacologist. In his annual report for 1884 he says :

"Plant analysis and pharmacological experiments, or the investigation of the chemical constituents of plants and their action on the animal organism call loudly for a recognition denied them. For the past twenty years but little has been accomplished in this line of research. Instead of taking, as it ought, a foremost place, on account of the immediate practical importance attached to its beneficent results applied to mankind, it has lagged behind its sister sciences, physiology and pathology. \* \* \* The medical profession of this country would watch our operations with great approval and profound interest and the *raison d'être* of this section of the United States National Museum would be proportionately increased. I would therefore respectfully and earnestly urge the necessity of providing a means for investigating the valuable stock of materials now contained in the collection."

No appropriation for this purpose was granted, but, taking advantage of

the courteous co-operation of the Johns Hopkins University, the Bureau of Animal Industry of the Department of Agriculture and the then recently inaugurated laboratory of the National Museum of Hygiene, Dr. Beyer was able to do some pieces of original research along general pharmacological and bacteriological lines.

There never has been, and probably never will be, any drug laboratory operated by the National Museum, for such work is manifestly foreign to an institution whose primary duty it is, to collect, classify, label, exhibit, and preserve articles of human interest. Plant chemistry, pharmacology and pharmacognosy have not, however, been idle in Washington, for in 1904 a pharmacologist was regularly employed in the poisonous plant investigations of the Department of Agriculture, and, more recently, a pharmacologist has been engaged by the Hygienic Laboratory of the Public Health and Marine Hospital Service and one each by the Bureau of Animal Industry and the Bureau of Chemistry of the Department of Agriculture. Chemical and pharmacognostic work on plants has been done for a longer period in the same branches of the Department of Agriculture and the drug collection has been frequently consulted by these men, especially in connection with the movement for the repression of food and drug adulteration.

The National Herbarium has long been sending out exploratory expeditions and accumulating valuable stores of both old and new species of plants from all parts of the world, especially from the United States and Mexico. It has not, of course, been chiefly interested in drug plants but these have been collected along with others and are now classified for ready reference.

Notwithstanding the large number of synthetic drugs and drugs of animal origin recently placed upon the markets, it is undoubtedly true that the great majority of the medicines in use to-day are of plant origin. Those most largely depended upon are those whose use has been most accurately worked out—the pure chemical substances, such as the alkaloids and glucosides from plants. As many of these are easily divided into groups, such as the alkaloids of opium and cinchona, some of the members of which are very closely related, and are, moreover, derived from closely related plants, it is readily understood that anyone about to attempt any research work on any substance obtained from one of these closely related plants should first consult a skilled systematic botanist and find out with which plant he is proposing to work. It could scarcely be expected that men skilled in any of these lines of work would have either the training or the facilities for determining botanical names with the greatest possible accuracy as they must be, especially when any considerable amount of work is to be carried out.

Pharmaceutical literature is to-day filled with many pages of otherwise carefully conducted work which is badly crippled and sometimes made

almost worthless because the author neglected properly to ascertain the name of the plant on which he worked. Such mistakes are not so apt to happen in the case of common or well-known plants, but when parts of these are taken from commercial sources there is danger of working with a spurious article. Many mistakes have thus crept into literature and have remained there because the investigations have never been repeated. Dr. Rodney H. True and Dr. W. W. Stockberger have, for example, recently shown that nearly all of the illustrations supposed to represent the microscopic structure of pinkroot (*spigelia*) are wrong because those who drew them worked with the commercial material which was principally the adulterant, *ruellia*. Another case which is called to mind is the report on an investigation made by a Mexican who, wishing to ascertain whether or not the common mountain laurel (*kalmia latifolia*) was the source of poisonous honey, made an extract of the leaves of a plant which grew in that country and had a similar common name. After concluding his experiments he published the results under the scientific name given above. The junior author of this paper, having previously had occasion to investigate the same subject, was skeptical about the plant used being the mountain laurel. He therefore requested the Mexican to send a sample of his plant. This proved, on arrival, to be the common oleander (*nerium oleander*). The investigator found that the bees, without injury to themselves, were able to accumulate poisonous honey made from the sweetened decoction of the leaves of this plant, but erroneously attributed the results to *Kalmia latifolia*. The error was really due to the author's confusion of the common name "rose laurel" used in the United States with the name "laurier rose" used in Mexico. An example of the ignorant or careless use of chemical terms by some medical writers is to be found in the description of a case of poisoning recently reported in one of our medical journals. This case was cited in the title as an unusual case of prussic acid poisoning, yet the symptoms described were very clearly those produced by the oil of mirbane, nitro-benzol, which the patient had spilled on his clothes. The author evidently thought that oil of mirbane contained prussic acid or confused it with oil of bitter almonds, which has a somewhat similar odor and does contain prussic acid.

These cases suffice to show that plant chemists and all who are working with plant substances should be vitally interested in seeing that the researches which they make be attributed to the proper plant. An exceedingly important question is raised here. Whom shall we consider an authority in such cases? Is it the local botanist, the over worked biology teacher or economic botanist of our State Experiment Stations or colleges, or is it rather the specialist in a comparatively small group of plants, be he where he may, who should decide the question? We claim that only the latter instance holds true. Are we then always to accept his judgment as final? Unfortunately this can not be so, for no botanist has

ever yet been able to tell just what a species is, and as a specific name is at best merely a convenient way of designating a certain plant as we know the related species now, our ideas are so constantly changing, that it seems imperative that specimens of any plant upon which a great deal of work is done should be placed in some great herbarium and alluded to in the account of the investigation under the particular number given by the botanist to the specimen. It should then, for all time, repose in the herbarium under that number and be always accessible to anyone who may wish to consult it. Then, if during a long interval of time, any question should arise concerning the exact identity of the plant, it could easily be inspected and the question settled. This should apply not only to botanical specimens selected as typical of the plant worked with, but also to the crude drug and, as far as possible, to the pure substance or substances isolated therefrom. If properly protected from light, these could then again, after many years, be made the subject of comparison with other similar substances isolated from the same or closely related plants. Each particular drug plant or drug chemical substance so deposited in the Museum would therefore have a particular historical importance and would be zealously guarded as being of very particular value.

Enough has probably been said to sufficiently emphasize the importance, to drug-research men and the many persons who use their results, of the fundamental work of the systematic botanist. These men frequently have been called upon by drug workers to trace up crude drugs to their proper botanical source, but this has not always proved an easy task and much of it remains yet to be done. In some cases, as in copaiba, there are various geographical varieties or grades of the drug. These products differ considerably in appearance, composition and value, according to their derivation from one variety or another, but it is not known from which species all of the grades are derived. In others, as in Winter's Bark (*Drimys winteri*) the action of the drug seems to be variable on account of it being taken from different varieties or perhaps species, sailing under the same scientific name; and in still others, as in coto and paracoto barks, the botanical origin of the drug is unknown. The solution of these and many other such problems can only be brought about when a properly trained man is sent to the region where the drug is gathered to study the drug taken directly from the plant. A great deal of courageous exploratory work and much patient herbarium research must be done before all of the questions can be solved. A vast amount of work on plant substances also remains to be done by the phytochemist and the pharmacologist. Some of the botanical work is strictly museum work and can be undertaken by the museum botanists as the problems arise, but it may readily be seen that the investigations of the pharmacognosist, the phytochemist and the pharmacologist, founded though they be on the researches of the botanist, cannot be undertaken directly by the National Museum. It is also ob-

vicious, however, that a big federal institution such as the Museum, with its extensive and rapidly growing herbarium, its expert botanists, its excellent libraries, and its unsurpassed facilities for exchanging books and specimens with political and scientific men and institutions of other countries, and which has already, through its fine educational exhibit, fostered so much public interest in drugs, is in a most excellent position to verify plant names and assist research workers in procuring authentic drug material, in helping to preserve the records and materials of their research and in most rapidly accumulating whatever is desirable in encouraging the original work of the pharmacognosist, the phytochemist and the pharmacologist.

Lack of space, and especially help, at the present time prevents much further growth of the drug collection, and much immediate co-operation by the Museum with drug-workers, but it is always found willing to assist in naming specimens upon which original investigations are based, and it is confidently hoped that, within a year, there will be more help and more space available for the further development of the drug collection, which will then soon bring it the full, sympathetic co-operation and good-will of all those who are interested in rendering the use of drugs more rational and more reliable to mankind.

The Division of Drugs, Bureau of Chemistry, of the Department of Agriculture, in connection with its work in the repression of drug adulteration, has found it necessary to inaugurate considerable research of various kinds on drugs, and has, therefore, felt the need of a closer co-operation with the Museum. It hopes in the future to get even more assistance from the Museum than it has in the past, and it also finds it desirable to lend its assistance in augmenting the Museum collection and in fortifying it in every way, and it is suggested that, if societies and individuals and all other institutions interested in drug research would unite in trying to build up the federal drug collection, the scientific aspect of drug work would be so much advanced that the United States would soon lead the world in the amount and character of the research work it turns out, and that, at the same time, it would share honors in the world's race for technological and manufacturing supremacy.

Mr. Edward Kremers, commenting on the paper just read, called attention to the work in which Dr. True, of the Bureau of Plant Industry, has been engaged for a number of years. The specimens that Mr. Kebler spoke of at the National Museum, he had had the pleasure—or the disappointment, rather—of seeing a number of years ago, and he was surprised at the way they were housed there, or rather put away. As far as the work of the Bureau of Plant Industry is concerned, it is much more effective and does not merely consist in sending a physician in the Government employ to some foreign island to make a collection of everything and bring it back with a label. Not only have specimens been col-

lected from all parts of the United States and the globe, but the misunderstanding concerning *Spigelia* and *Ruellia* has been worked out by Dr. Stockberger, in the laboratory of Dr. True. He said it seemed, however, that the information had not spread very far, although it has been published more than a year ago.

The Chair said there was left a paper by himself and Mr. Bernegau upon the "Interference of Sodium Bicarbonate in the Testing of Pancreatin," and he asked Mr. Wilbert to take the chair while he presented it. Thereupon Mr. Vanderkleed presented his paper in abstract, the full text thereof being as follows:

#### INTERFERENCE OF SODIUM BICARBONATE IN THE TESTING OF PANCREATIN.

BY CHAS. E. VANDERKLEED AND L. HENRY BERNEGAU.

At the 1907 meeting of this Section in New York City, Mr. F. C. Koch, of Chicago read a very important paper\* on the U. S. P. methods for assaying pepsin and pancreatin. With regard to the latter he pointed out the utter unreliability of the U. S. P. milk-peptonizing test, which, until the U. S. P. Eighth Revision became official, was the only method given for determining the value of pancreatin. The valuation of pancreatin, in the present pharmacopœia, however, is based upon its starch-converting power, and while the U. S. P. assay process as pointed out by Koch, leaves much to be desired, and can, and undoubtedly will be, improved in our next Pharmacopœia, this method is so much superior to the old milk-peptonizing test, that it is safe to say, it has entirely displaced the older method for the valuation of pancreatin.

Regarding the action of acids and alkalis on the complex mixture of enzymes known as pancreatin, the U. S. P. has the following to say:

"It exhibits its peculiar activities in neutral, faintly alkaline, and faintly acid media; more than traces of mineral acids, or large amounts of alkalies render it inert. Alkali carbonates exert slightly inhibitory power upon pancreatin."

Whether or not the Pharmacopœia intended to include the very faintly alkaline sodium bicarbonate in the above references to "alkalies" and "alkali carbonates," is uncertain, but two facts would seem to indicate that it was not intended to be so included. The first of these two facts is that in the U. S. P. test of the milk-peptonizing power of pancreatin, sodium bicarbonate to the extent of more than five times the weight of the pancreatin, is added to the solution used in the test. The second fact is that the "Compound Pancreatic Powder" of the National Formulary is composed of one part of pancreatin to four parts by weight of sodium bicarbonate.

Although it is true that no sodium bicarbonate is directed to be used in

\* Proceedings of A. Ph. A., 1907, Vol. 55, p. 372.

the U. S. P. assay for starch-converting powder, it is evident that sodium bicarbonate to the extent of four to five times the weight of pancreatin used was not intended to be included in the pharmacopœial references to "alkalies and alkali carbonates" above quoted. Moreover, it is popularly supposed that such small amounts of alkalies are helpful rather than otherwise, to the activity of pancreatin, which is generally prescribed in combination with more or less sodium carbonate or bicarbonate.

Our discovery that sodium bicarbonate does have a marked inhibitory action on the starch-converting power of pancreatin was therefore quite a surprise, and came about in the following manner:

A sample of Compound Pancreatic Powder, N. F., was submitted for test as a check on the accuracy of the department manufacturing the goods. In testing this sample, an amount (1.5 Gm.) corresponding to the required 0.3 Gm. of pancreatin, was taken and assayed by essentially the U. S. P. method. It was found that the pancreatin present, if in the proportion called for by the N. F. formula, tested only 1 to 15, instead of 1 to 25. Knowing that the pancreatin used in the mixture had previously been tested and reported to be of full U. S. P. strength, 1 to 25, it was at first thought that something had caused the pancreatin itself to lose strength. Another portion of the same lot of pancreatin used in the mixture was therefore again submitted, and was found to assay 1 to 25, just as it had before.

We then made the following experiments: Mixtures of pancreatin with sodium bicarbonate were made in the proportion of 4 to 1 (80 per cent.), 2 to 1 (66⅔ per cent.), 1 to 1 (50 per cent.), 1 to 2 (33⅓ per cent.), and 1 to 4 (20 per cent., or Compound Pancreatic Powder, N. F.). Amounts of these mixtures were then taken, corresponding to 0.3 Gm. pancreatin (or more, as required), and tested by means of the U. S. P. test on starch. The starch and sodium bicarbonate used were both tested and found to be strictly of U. S. P. quality. The following table shows the results obtained:

Mixture.	Per cent. Pancreatin.	Per cent. NaHCO <sub>3</sub> .	Am't of mixture req. to con- vert 7.5 Gm. Starch.	Result Pancre- atin present tests.
1 to 0	100 %	0 %	0.300 Gm. = 0.300 Gm. Pan.	1 to 25
4 to 1	80 %	20 %	0.375 Gm. = 0.300 Gm. Pan.	1 to 25
2 to 1	66⅔ %	33⅓ %	0.450 Gm. = 0.300 Gm. Pan.	1 to 25
1 to 1	50 %	50 %	0.682 Gm. = 0.341 Gm. Pan.	1 to 22
1 to 2	33⅓ %	66⅔ %	1.125 Gm. = 0.375 Gm. Pan.	1 to 20
1 to 4	20 %	80 %	2.500 Gm. = 0.500 Gm. Pan.	1 to 15



That the action of the sodium bicarbonate is merely an inhibitory one, affecting the assay, and that pancreatin in dry mixtures with sodium bicarbonate is not injured, was shown by keeping such mixtures for several weeks, and then before testing them, nearly neutralizing the alkali with hydrochloric acid. In every case the pancreatin tested 1 to 25.

*Conclusion:* The presence of sodium bicarbonate in amounts greater than  $33\frac{1}{3}$  per cent. reduces the amylolytic power of pancreatin, as determined by the U. S. P. method. The reduction is greater as the amount of sodium bicarbonate is increased. The full activity of the pancreatin is restored on neutralizing the excess of sodium bicarbonate.

*Suggestion* for the improvement of compound pancreatic powder N. F., that it be made up of 1 part pancreatin,  $\frac{1}{2}$  part sodium bicarbonate, and  $3\frac{1}{2}$  parts sugar milk, instead of 1 part pancreatin and 4 parts sodium bicarbonate.

Mr. Francis, commenting upon the paper just read, said that the author had covered only half of the subject very interestingly, but how about the digestive power upon the proteids?

Mr. Vanderkleed responded that his intention was only to touch upon the interference of sodium bicarbonate in the assay of pancreatin mixtures. There was no attempt to go into the therapeutic value of pancreatin or of its mixtures so made, the paper being confined entirely to a study of the U. S. P. assay process as applied to mixtures containing appreciable amounts of sodium bicarbonate.

Mr. Vanderkleed resumed the chair, and asked if there was any other business to come before the Section.

Mr. C. E. Caspari said that, under that head, he thought the Section should extend a vote of thanks to the officers who had presided at this meeting, for the very excellent way in which the work of the Section has been conducted, and he moved accordingly, that the thanks of the members be extended to the officers of the Scientific Section for this meeting. This motion was seconded by several members. Mr. Sayre, from the floor, put the vote on the motion, and it was carried unanimously.

Mr. Vanderkleed said that, on behalf of the Committee and Mr. Wilbert, who had so kindly assisted him, he thanked the Section most heartily for the good will expressed.

The Chair stated that the next business before the Section was the installation of officers, but as these officers were already in the chair, it would be hard to carry out that program, and so that matter would be dispensed with. He said he was not unmindful of the great honor the Section had done in electing him to the Chairmanship, and he appreciated it all the more from the fact that he had been working on the committee for two years past now, and this served to make him feel his responsibility to a greater extent than if he had known nothing of the work involved. He

said he would take pleasure in doing all in his power to make the work of the Section a success for the coming year. He also said the members of the Scientific Section had a work to perform in pushing the Scientific work of the local branches of the American Pharmaceutical Association; that there were already a great many of these branches now, and perhaps there would be more in the future, and he believed that it was important that those who were faithful in their attendance on this Section at the annual meetings of the Association do a good work by keeping that part of the work going in the local branches, and in this way he thought a nucleus would be formed for material to be brought together at the next annual meeting.

Mr. Wilbert thanked the Section for the honor bestowed on him, and promised to work faithfully in assisting the Chairman to prepare a good working program for the next year.

Mr. Vanderkleed said he had some hesitancy in accepting the Chairmanship of the Section, owing to the fact that he feared some one might think he was trying to monopolize the position; but he believed, on occasions like this, it was customary to make an announcement, and he would make the declaration now that under no circumstances would he serve a *fourth* term.

Chairman Vanderkleed announced that he and Secretary Wilbert had selected as their associate on the committee Mr. A. H. Clark, of Chicago.

On motion of Mr. Asher, the Section then adjourned *sine die*.

# MINUTES

## OF THE

### SECTION ON PRACTICAL PHARMACY AND DISPENSING.

---

FIRST SESSION—FRIDAY MORNING, SEPTEMBER 11, 1908.

Chairman F. M. Apple, of Philadelphia, called the Section on Practical Pharmacy and Dispensing to order at 10:45 a. m., and stated that the Secretary was not present, but his associate on the Committee, Mr. W. L. Scoville, was, and he would act in that capacity.

The Chair called attention to an attractive display of U. S. P. preparations on the table, made by Mr. L. M. Baughman, a clerk for D. F. Jones, of Watertown, S. D.

The Chair asked Mr. Scoville to take the chair while he read his address, which here follows:

#### CHAIRMAN'S ADDRESS.

*Fellow-members:* As Chairman of this Committee, in compliance with the mandates of the By-Laws, Chapter IX, Article XI, it affords me pleasure to have the honor to present at this time the annual address for your consideration.

Inasmuch as this year marks the first decennial anniversary of the organization of this Committee, also that the greater percentage of the members of this Association have affiliated therewith within the past five years, I have decided to offer a brief historical record of this Committee, presuming that it will prove as interesting to my hearers as it has proven to myself.

The first record to be found pertaining thereto is that of the minutes of the Council of September 3, 1898, convening in Baltimore, Md., as follows: "Resolved, that the Council advise the formation of a Committee of Practical Pharmacy and Dispensing, and recommend that the Council be authorized to devote so much of a general session of the next meeting as may be necessary to receive the report of this Committee and the matters it may present, and that it be also recommended that the sum of fifty dollars be appropriated for the use of this Committee."

Prof. H. P. Hynson was chosen, unanimously, as Chairman for the forthcoming year, which office he occupied for three successive years.

The great struggle this Committee encountered for its continued existence during those three years can only be fully appreciated by the Chairman thereof, to whom all

praise is due for his persistent efforts in the face of most discouraging apathy upon the part of the rank and file of the members of this Association; and the survival of this lusty infant Committee is due more to his careful and faithful nursing and entreating than to any other cause. 'Twas fortunate indeed that it did not "die a-borning," as it undoubtedly would have done had it not had such a resourceful and patient sponsor; and even he was sorely tried, as is evidenced by the following prefatory remarks in his first address as Chairman: "Disappointed but not discouraged, etc." A careful perusal of the minutes of those years will prove most interesting and edifying to all interested in the history of this Committee.

After these trying years the pathway became much smoother, filled with less rocks and obstacles, under the guidance of Messrs. H. P. Hynson and Wm. F. Kaemmerer in 1902 (the Chairman-elect having resigned), and Mr. Geo. M. Beringer in 1903, but in 1904, Mr. Wm. H. Burke, Chairman, an attempt was made to consolidate this Committee with the Committee on Commercial Interests. To demonstrate that such action was not desirable at that time, it is only necessary to note that the effort was defeated by the decisive vote of 39 to 9.

The interest of the retail pharmacists and dispensers had by this time been aroused to an encouraging degree, and a larger number have evidenced their interest in this Committee's work from year to year, by contributing papers of merit from their vast store houses of knowledge, gained largely by practical experience, under the successive leaderships of Messrs. Chas. A. Rapelye, 1905; Wm. C. Alpers, 1906; H. A. B. Dunning, 1907, and the present incumbent of the office. (For a complete list of the officers will refer my hearers to the annual Proceedings of the Association).

Having hurriedly reviewed the record of this Committee we may (and undoubtedly will) inquire, what is its present outlook?

Tersely expressed, we will state that its success or doom depends entirely upon the activity or inactivity of the practical pharmacists and dispensers themselves.

Inasmuch as the National Formulary, which is the property of this Association and for which it stands as sponsor, has suddenly leaped into increased prominence as an authoritative standard work, due to the passage of the U. S. Pure Food and Drug Act of June 30, 1907, and the several state laws patterned thereafter, and as this Committee has been recommended by the Committee on National Formulary to serve as the proper point of entry for constructed formulæ for admission into the National Formulary—see page 68 A. Ph. A. Proceedings 1907—it is self-evident that its field of usefulness has been appreciated, and is to be further extended.

As propaganda committees for the introduction of the formulæ of the U. S. P. and N. F. to the medical practitioners are active upon every side, the N. F. must receive most careful attention at the hands of all practical pharmacists and dispensers, to the end that any possible errors contained therein may be corrected, also that any obsolete preparations may be discarded and valuable additions included therein.

The careful observer cannot fail to notice the agencies that are actively at work to eliminate the practical pharmacists' and dispensers' field of usefulness, and make their vocation one that may at an early date be recorded as a useful calling of the past.

The physicians are educating the public so to live that disease will be eliminated, to a large degree at least, by prophylactic measures; and the latest therapeutic agencies laying claim to fame and fortune, Opsonins, require thoroughly equipped laboratories for their preparation, such as the ordinary dispensing pharmacists have not in their possession.

Reflect and consider the great changes that have taken place in the treatment of diseases of all kinds, the large variety of new systems of treating disease that have arisen, *i. e.*, Osteopathy and Christian Science, almost all of which tend towards the reduced use of drugs and their compounds; also the increased utilization of hygienic agencies,

such as heat, cold, massage, baths, hydrotherapy, electricity, change of climate, corrections of diet, the administration of easily assimilated foods, etc., which changes also lead to greater simplicity in medication, and the necessity for the utmost accuracy and care in the preparation and preservation of our drugs immediately becomes apparent.

This brings to mind the recommendation embraced in the address of the chairman of this committee of last year to the effect that closer relationships should exist between the several committees of this Association, particularly so those of the Scientific Section and this Section, and I wish to add my hearty endorsement thereto.

This post-graduate course in pharmacy should be conducted with perfect system and order, thereby increasing its effectiveness many fold, and making it more attractive to those students who are anxious to keep abreast of the times and prove themselves creditable votaries of their calling in life.

The physicians are awakening to a full realization of the manifold advantages of adhering closely to the U. S. P. and N. F. preparations as their armamentarium in the treatment of disease, and they are demanding more thorough courses of instruction in the colleges of medicine upon the U. S. P. and N. F. preparations, which will prepare the future physicians to pass more critical judgment upon those preparations; hence a far greater responsibility devolves upon the dispensing pharmacists, who must look for their future education, in matters practical, largely to this Association.

As this committee was organized to exercise control over and supervise the practical problems of compounding and dispensing offered to this Association, its increased importance and responsibilities immediately becomes apparent; but inasmuch as the contributors to this course of instruction will be found to a very large degree amongst those actively engaged in the retail drug business, a responsibility and duty falls upon each and every member of this Association so engaged.

Will they measure up to the requirements? It is imperative that each and every one awakens to a full realization of the demands of the hour; also that they make proper preparations to reap to the fullest extent the benefits that must result from the general tendency of the medical practitioners to discard ready-prepared proprietaries and medicines in convenient dosage form—oftimes at the expense of therapeutic qualities—and lend all possible assistance to those engaged in the praiseworthy efforts to reform the practices of pharmacy and medicine. The best possible method of lending assistance is by carefully inspecting one's stock and guaranteeing that we are prepared to properly compound the prescriptions for the U. S. P. and N. F. products when they are prescribed. Great caution must be exercised that the crusade for the reform of the sister professions of medicine and pharmacy is not brought to a disastrous termination by possible sins of omission and commission on the part of those of our calling; hence it is an opportune moment to sound a note of caution and a call to action to the weaker members of our profession; also to remind the stronger ones of the obligations resting upon them, to lend a helping hand to the weaker brethren.

Let me recommend that each one of our profession will make a new resolution, to prove of as great service to his neighbors as strength and time will permit, and success must result.

The following resolution from the pen of the editor of the "World's Work," appearing in the January, 1908, issue thereof, is offered for your careful consideration and meditation:

"Now there is one way in which every efficient and energetic person can help some less efficient person that is worth thought in this season of good resolutions. Take the cue from the methods of the Federal Agricultural Department in its 'demonstration' work on farms. A governmental 'demonstrator' will go to a farmer and show him how, by simple methods of right farming, he may increase his yield by 25 per cent. or 50 per cent., or possibly double it. By tact he persuades the farmer to try the 'experi-

ment on a small area. The net result, of course, is a complete revolution in method by the farmer, if he be a teachable man, as well as by all the better class of farmers in the neighborhood. But it requires tact and high social qualities to do that."

"If you have tact and high social qualities of a corresponding kind you may be of a similar personal service to some member of your own craft or calling, with whom you are, or can come to be, in friendly and even intimate relations. If you are more efficient than he, you can teach him."

"One lack in life, as it goes on day by day, is the lack of such direct, personal friendly suggestion about our daily work. We go through some formal training or apprenticeship which we regard as a period when teaching is proper. But, as a rule, after we begin work or practice, nobody teaches us. True, every observing man learns valuable lessons from his associates or rivals: but the vast mass of workers learn little after the period of formal training except by their own experience. It is seldom that a companion or rival offers helpful suggestions."

"Now the point of this whole sermon is not only or mainly that you should be generous and tactful and social enough to help a worker at your own trade or business or profession—that is a good thing to do. But a better thing, perhaps, is to make sure that you are yourself sufficiently open-minded and hospitable to friendly help to get the good service that wiser and more skilful men about you will gladly give, if you have the proper friendly receptivity and a spirit of reciprocity. Most inefficient men are pig-headed men and instinctively resent suggestions about their own business. The first quality that will make you helpful to others this year, or any year, is your own receptivity of help and your frankly friendly attitude even to your competitors. If you have the temperament to welcome help yourself—if you are yourself teachable—you have the first quality that is required to help others."

We must be ever mindful of the fact that in assisting to elevate our fellow workers we cannot fail to be greatly benefited ourselves; and in the uplifting of our profession as a whole, we will not fail to be beneficiaries therefrom, morally, mentally and financially.

Every one of us believes in the wisdom of the Golden Rule, but why should we wait for our neighbors to force us into the position of debtors?

In conclusion, let me exclaim in the language of Bacon: "I hold every man a debtor to his profession: from the which as men of course do seek to receive countenance and profit, so ought they of duty, to endeavor themselves, by way of amends, to be a help and ornament thereto."

The Chair called for action upon the address just read, and Mr. Payne, of Georgia, moved to receive and refer to the Committee on Publication—unless there were some recommendations in it, and he did not believe there were. Mr. Hynson seconded this motion, and said he knew that Mr. Apple had given a great deal of time and attention, at a great personal sacrifice, to the work of the Section, and he thought his loyalty and efficiency in his work ought to be highly appreciated by all who are interested in practical pharmacy and dispensing. He expressed the hope that other chairmen of the section who followed him might be as active, as interested and as efficient as Mr. Apple had been.

The motion to receive the address and refer to the Committee on Publication was then put to a vote and carried.

Mr. Apple resumed the chair, and called for the nomination of officers of the Section for the ensuing year as the next order of business.

Mr. Wilbert nominated as Chairman of the Section Mr. L. A. Seltzer, of Detroit, and this motion was seconded by Mr. Dunning. Mr. Hynson nominated Mr. E. Fullerton Cook, of Philadelphia, for Secretary, and explained that, although the gentleman was a professor in the Philadelphia College of Pharmacy, he was also an active pharmacist, as he understood. This nomination was seconded by Mr. Kaemmerer.

The Chair stated that there was only one Associate to be elected, according to the By-laws, and that all of the members of the Committee ought to be actively engaged in the retail drug business. Thereupon Mr. Hynson said he did not like to nominate everybody, but he would like to see a gentleman put in nomination who had always been active in the work of the Section—a man who gave encouragement to the Committee at its organization. He said he knew it was only something imperative that kept him from being here on this occasion. He referred to Mr. Otto Raubenheimer, of Brooklyn, N. Y. He said he did not nominate the gentlemen himself, but if it was the sense of those present, he would like to see him nominated. Thereupon Mr. Beringer proceeded to nominate Mr. Raubenheimer for Associate, and Mr. Ladish seconded this motion.

The Chair stated that opportunity would be given for further nominations at the next session.

The Chair announced the reading of papers as the next order of business, and called on Mr. William Mittelbach, of Boonville, Mo., to read his paper on "Compound Syrup of Squill." Mr. Mittelbach presented his subject as follows :

#### COMPOUND SYRUP OF SQUILL.

BY WILLIAM MITTELBACH, BOONVILLE, MO.

The official directions in making this syrup, wind up as follows : "Strain the syrup, and add water enough through the strainer to make the required amount." I have always found it rather a slow process to dissolve all the sugar, especially when making a small quantity.

By reversing the finishing steps in the procedure, adding the requisite amount of water for the quantity wanted, and then straining, I find that the process is shortened, and believe a more stable syrup is obtained. The little loss of sugar hanging to the strainer does not materially affect the preparation, and none of the foam and other inert matter hanging to the strainer is washed into the syrup. Several of the other official syrups are improved likewise, I believe, if manipulated this way.

The Chair stated that there were several other papers on similar subjects, and that the three papers on syrups would be read and discussed together. The next paper, he said, was on "Syrup of Orange," by Henry P. Utech, of Meadville, Pa. The author of this paper was not present, and the paper was passed. The full text of this paper here follows :

## NOTES ON PREPARING SYRUPUS AURANTII.

BY P. HENRY UTECH, PH. G., MEADVILLE, PA.

A formula for preparing syrup of orange similar to the present one has been official, with but slight modifications, for the past four or five decades. In brief, they are simply processes for extemporaneously extracting the volatile oil from the rind of the fresh fruit with an alcoholic menstruum, and subsequently treating this liquor with magnesia and sugar to render it water-soluble before admixture with the requisite amount of sugar or syrup. So far as my experience goes, many of these formulæ were thoroughly satisfactory in regard to character, permanence and pharmaceutic elegance.

In the Eighth Revision, however, the committee preserved the rationale of the original processes and, in addition thereto, incorporated a small quantity of citric acid, with a view, perhaps, of increasing the efficiency of the preparation as a vehicle for certain nauseous drugs.

This addition seems to impair the permanence of the product. As at present devised, the preparation appears to contain all the agents necessary to produce fermentation minus the heat, and this latter is supplied unconsciously in the summer time, as well as in over-heated store rooms at any time. In fact I have had two successive lots of the syrup deteriorate within a few weeks after preparation.

With a view of overcoming this objection, the following formula for preparing the syrup extemporaneously was devised :

Oil of sweet orange (recent).....	6 Cc.
Citric acid .....	5 Gm.
Magnesium carbonate .....	4 Gm.
Alcohol	
Water of each a sufficient quantity	
Syrup to make.....	1000 Cc.

Mix the alcohol and water in the proportion of forty cubic centimeters of alcohol to twenty cubic centimeters of water. Triturate the oil intimately with the magnesium carbonate in a mortar and gradually add the mixture of water and alcohol. Filter, and add alcohol and water mixed in the same proportions as above, to obtain sixty cubic centimeters, returning the first portions until a perfectly clear solution is obtained. Dissolve the citric acid in this liquid and, lastly, add sufficient syrup to make one thousand cubic centimeters.

When there is little demand for the syrup by simply keeping on hand the spirit of orange prepared as in the first step of the process, one can make it up extemporaneously by simply adding 2 Cc. of the spirit to 30 Cc. of syrup.

The formula herewith suggested possesses the advantage of economy in manipulation ; is much superior in point of permanence ; and if care be



taken in selecting a strictly fresh high-grade oil the finished product combines also the characteristic flavor and elegance of the U. S. P. syrup.

The Chair stated that the next paper was entitled, "Syrups of the United States Pharmacopœia, Eighth Revision," by E. Fullerton Cook, of Philadelphia, and he would ask Mr. Remington to present this paper in the absence of the writer. He said it was an exhaustive paper on the U. S. P. syrups, and represented a great deal of labor. Mr. Remington thereupon came forward and read the paper as follows :

#### SYRUPS OF THE UNITED STATES PHARMACOPŒIA.\*

BY E. FULLERTON COOK, P. D.

Syrups are usually defined as solutions of sugar, mostly flavored or medicated, which are particularly valuable because they are relatively permanent preparations, due to the preservative action of sugar, but one of the annoyances which confronts the pharmacist, and often renders the syrup unfit for use, is the development of what is commonly called, "mould growths," due to the presence of microscopic organisms. Two classes are usually found : the surface growth or ærobic variety, having a black or dark-green color, and belonging to the group of *Mucors* ; the other an organism developing in the liquid, below the surface, commonly of the group *Penicillium*, resembling a mass of light-colored threads. Frequently both of these varieties will be found in the same preparation.

Some syrups are especially susceptible to such growth, apparently furnishing the best culture media for their development ; this is especially true of syrups containing hypophosphites or citric acid ; yet most syrups are more or less subject to such deterioration, and it is one of the most important to eliminate.

The addition of preservatives, such as sodium benzoate or salicylate, would probably overcome this annoyance at once, but these are objectionable for legal reasons, if for no other.

Discontinuous sterilization (sterilization of the same sample on several successive days) of the finished syrup, and its preservation in special bottles, stopped with cotton, and from which the syrup may be drawn through an orifice at the bottom of the bottle, has been suggested, but, while the process will destroy the organism, it possesses disadvantages which make it impracticable, in most cases. Syrups of delicate flavor or those containing volatile acid, such as orange, orange flowers and wild cherry, would be injured by the heat while the sugar would be caramelized and the syrup darkened, especially if sterilization under pressure is the process employed.

The practical remedy, therefore, seems to be to prepare the syrup in

---

\* Notes made during the preparation of check specimens for the Revision Committee of the United States Pharmacopœia.

such a manner that no mould organisms are present, because the necessary care and precautions in making it have been taken ; this is far better than to attempt to destroy the micro-organisms and the undeveloped spores after the syrup has been inoculated with them. It is the same problem which the surgeon faced—although in his case a much more difficult one—when he learned that it was simpler to operate under aseptic conditions with the germ life practically eliminated, than to destroy the germ after the wound had been infected.

By working, therefore, under conditions as free as possible from the presence of mould organisms the best results can be obtained. Most "tap" water will show the presence of micro-organisms, if a sample be incubated for a few hours in a suitable culture medium, and such water, if used in making syrups or even used in washing the bottles and utensils, will at once introduce the growth.

Even though a syrup be made by the hot process, and boiled vigorously for a few minutes, the spore of the organism will not be destroyed, because, the spore is capable of far greater resistance to the action of heat, than is the developed organism, and in fact the first heating may but start the growth of the spore and, to insure the destruction of the organism, will require a second or third heating, at a boiling temperature, of from ten to thirty minutes each time, on as many successive days.

However, if the water to be used in the making of the syrup and in the rinsing of the bottles and utensils, be so treated and preserved that this organism is eliminated, if the bottles be rinsed thoroughly with such water and all ingredients entering the syrup carefully selected and protected from dust, and if the operator observes personal cleanliness and sees that the laboratory and utensils are also clean and free from dust, then most of the annoyance from the presence of growths in syrups and other pharmaceutical preparations will be overcome.

How to obtain water free from this objection is the next problem. The Pharmacopœia does not direct that distilled water be used and even this would not be free from the presence of micro-organisms unless it had been very carefully protected from atmospheric contamination. Besides, it is a well-known fact that when a distilled water becomes inoculated with an organism the development of new colonies is much more rapid than in ordinary water. Water passed through a well-made, porous-stone filter, like the Pasteur or Berkefeld, has repeatedly shown an entire elimination of the mould growths and such water would in most cases be suitable. The experiments on the heating of water to boiling for ten minutes, or longer, each day, on three successive days, in order to kill both the developed organism and the undeveloped spore, have not been completed, but it is doubtful if a boiling temperature will be sufficient in this case, since such a temperature is only sufficient to kill the developed spore and, as there is no food present in the water, the undeveloped spore, even

under the stimulation of heat, may remain undeveloped until a suitable medium is present.

The quality of the sugar is an important consideration in the making of this class of preparations. By noting the results described under "Simple Syrup" it may be seen that the inferiority of certain syrups may be traceable to the sugar. It is almost the universal custom to send to a near-by grocery for the sugar needed in the pharmacy. Such sugar is usually dirty, from the presence of chips of wood from the lid, paper, etc., or it is damp, or has been optically whitened by the addition of ultramarine and been exposed to the best possible conditions for contamination with mould growths. Such sugar is wholly unfitted for the making of pharmaceutical preparations.

Special grades of sugar can now be obtained for pharmaceutical uses, guaranteed to be free from all impurities, even the added ultramarine, and occur in large, pure white, crystalline granules. Such sugar costs but a trifle more per pound than ordinary sugar and should be used for the official syrups if the best results are to be obtained.\*

The results of a number of experiments show that where the percolation process for the taking of syrups is possible, it is far preferable to either cold agitation or the use of heat. The apparatus usually being glass, it can be thoroughly cleaned and the syrup, at no step of the process need be exposed for any length of time to the air, as is the case when heated in a kettle. Furthermore, the hot process or the cold agitation method usually leaves considerable foreign matter, chips of wood, etc., in the syrup, necessitating straining through a cloth or strainer, the latter frequently, it is believed, being the source of mould infection, and in addition the hot process usually leaves some dried sugar or a very thick syrup around the edges of the kettle, which it is difficult to again dissolve, thus making the syrup deficient in sugar content.

When finished syrups by the two processes, percolation or the solution of the sugar directly in a definite amount of water, are compared, the difference in the appearance is striking.

The one made by percolation is brilliant and free from foreign particles, having been passed through a filter of absorbent cotton, while the other is usually more or less cloudy, due to the presence of small particles of foreign matter which have passed through the straining cloth. It has been suggested that all syrups be filtered through paper, but this is very tedious, and in most cases impossible without the use of hot filtration, which, in turn, is objectionable, through its causing evaporation and often injury to the syrup.

---

\* This special grade of sugar may be obtained from the wholesale drug houses, if insisted upon; it is known commercially as "Sugar Crystal A" and is quoted at a figure between 5 and 6 cents per pound, in barrel lots.

The one objection to the percolation process is the length of time required for its completion, but this should or need not be considered in a store where stock is carefully watched and preparations are made before actually needed. The superior character of the preparations so made, and the fact that it requires less actual labor should more than counterbalance this one objection.

A number of the official processes direct the solution of the sugar in a medicated water, by agitation, without heat. In most of these cases the percolation process can be used to advantage, and the agitation process as at present official is needlessly tedious and laborious. This is especially true when a perfectly dry and "large-crystal" sugar is used. In fact in several instances in official processes it was impossible, even after prolonged agitation in a bottle, daily during several weeks, to dissolve the whole of the sugar in the quantity of water prescribed. The small amount remaining, however, quickly dissolved when a sufficient quantity of water was added to make the product measure 1000 Cc.

A desirable modification of the agitation process would be to direct that the medicated liquid be introduced into a graduated, glass-stoppered, tincture-bottle, of suitable size, the sugar poured in, and enough water added at once to make the contents of the bottle measure about 980 Cc. Finally, when the sugar has dissolved, through agitation, add a sufficient quantity of water to make the syrup measure exactly 1000 Cc. There is present from the first, through this modification, almost the maximum amount of water, the sugar quickly dissolves, and when the syrup has been strained the few remaining Cc. of water may be added to finish the syrup. The use of a glass-stoppered bottle, about a "5 pint" size if a liter is being made, will also prevent the too-frequent habit of closing the neck of a wide-mouthed bottle with the palm of the hand, while agitating to dissolve the sugar, whereby impurities are introduced and a loss of syrup results.

#### SYRUP ("SIMPLE.")

Experiments were made along a number of different lines; the hot process and the percolation method were compared with the same grades of sugar; samples were made from a selected quality of pure sugar and also from grocers' or commercial sugar; these in turn were subjected to a variety of conditions to determine the causes of mould growths and the best way to prevent them or destroy them. The results of these experiments are shown in the following table: (See next page.)

## Syrup (Syrupus, U. S. P.).

No.	Made.	Process.	Water.	Sugar.	How Prep.	Sp. Gr.	Results after one year.
A	7-18-07	Heat	Tap	Best	In sterilized bottle, using sterilized cork, bottled hot.	1.332	No precipitated ultramarine. One surface organism, dark in color, on side of bottle at surface, and another growth, light in color, floating in the liquid.
1 AA	7-18-07	Heat	Tap	Best	Heated in steam for ten minutes each day for three successive days.	—	No noticeable caramelization. No micro-organisms present. No precipitated ultramarine.
1 AAA	7-18-07	Heat	Tap	Best	Bottle washed with tap water, opened every few days and small amounts removed.	—	Within six months there had developed many dark-colored surface colonies and a large quantity of growth resembling masses of cotton fiber, interspersed with dark spots.
1 B	1-19-08	Percolation *	Filtered	Best	Bottle washed with filtered water.	1.313	This syrup is far more brilliant than those made by heat, and is lighter in color; in fact entirely free from color. A light-colored, slight, filmy growth has developed in the liquid. No precipitated ultramarine.
1 BBB	1-19-08	Percolation	Filtered	Best	Bottle washed with filtered water, opened from time to time and small amounts removed.	—	Same as 1 B.
1 C	7-18-07	Heat	Tap	Grocery	In sterilized bottles, using sterilized cork, bottled hot.	1.312	Yellowish in color. Three or four large colonies of brown-colored, filmy masses and many smaller ones in the body of the syrup. Distinct precipitate of ultramarine. The yellow color shows that the sugar had never been purified, but whitened by adding ultramarine.
1 CC	7-18-07	Heat	Tap	Grocery	Heated in steam for ten minutes each day, on three successive days.	—	Color a distinct yellow; darker than 1 C. No micro-organisms present. A distinct precipitate of ultramarine.
1 CCC	7-18-07	Heat	Tap	Grocery	Bottle washed with tap water, opened every few days and small amounts removed.	—	Yellowish in color as 1 C. Many colonies of brownish-colored masses of developed organisms all through the liquid. A distinct precipitate of ultramarine.

\* Care was taken that the glass apparatus was clean and the syrup protected from dust and from evaporation. Practically all of the sugar dissolved in the 450 Cc. of water first added. It required 34 Cc. more water, added through the cotton, in the percolator, to make the product measure exactly 1000 Cc.

## SYRUP OF ACACIA.

The acacia dissolved readily in the amount of water directed ; it having entirely dissolved, without stirring, while standing over night. The acacia, however, should be carefully selected and only clean, light-colored tears used. Instead of using a dish, which usually means an open dish which will expose the solution to the dust of the store or laboratory for many hours, a bottle of suitable size is preferable if the necessary precautions are taken, subsequently, when heating the solution to dissolve the sugar. If the bottle is placed in a water-bath when cold and the bath afterwards heated, there will be no danger from breakage on account of the sudden expansion of the glass.

The 430 Cc. of water used to dissolve the acacia and later the sugar, could, to advantage, be increased to 480 Cc. As now official the sugar dissolves with some difficulty, the solution is very viscid, and it requires at least 100 Cc. of water at the finish to make the product measure 1000 Cc. With these modifications in the process the formula and product are very satisfactory.

Samples kept under various conditions all developed micro-organisms within a few months ; the sample which was subjected to heating in steam for ten minutes each day, on three successive days, developed the least growth, although even in it there was a small amount of organism.

## SYRUP OF CITRIC ACID.

The addition of the tincture of fresh lemon peel, directly, to the syrup, produces a preparation which is slightly cloudy, at least not so brilliant as is syrup of orange, in which a medicated water is made, with the use of an absorbent powder, and the sugar dissolved in this. The two syrups are practically identical as to type and yet are made in different ways, certainly with the advantage, considering the finished product, with the orange. The syrup of orange made by this method requires more time but in a sample of the syrup of citric acid made in this way, the flavor seemed to be better. The syrup is one which should not be long kept since it quickly becomes terebinthinate in odor and taste.

There are no apparent micro-organisms in any of the samples, either sterilized, or carefully protected or exposed, notwithstanding the presence of citric acid, which is so prone, when in solution, to develop such a growth. This may be due to the turpentine-like oil which is present and possesses well-known inhibitory powers. The taste and odor is strong and disagreeable, distinctly terebinthinate and had become so six months after it was made.

## SYRUP OF HYDRIODIC ACID.

When this syrup is made by the present official process, the greatest care is necessary in selecting the diluted hydriodic acid. If the acid is prepared in the store or laboratory it is important to first select the best grade

of chemicals (crystal salts, especially tartaric acid, are preferable since they are freer from impurities) ; they should be carefully weighed and all apparatus used in the process must be scrupulously clean.

This is necessary since the acid quickly absorbs any foreign odors and produces an unpleasantly odorous syrup. When the alcohol is evaporated the temperature must not be too high and the last traces of alcohol should be dissipated, if the syrup is to be satisfactory. The syrup is very light in sugar content (about 510 Gm. of sugar in 1000 Cc. of syrup) and the reduction in the amount of sugar, as compared with the 1890-syrup, has entirely overcome the tendency of the acid to caramelize the sugar, darkening the syrup. Samples of this syrup have stood for several years without darkening and if the syrup and acid have been carefully made, using the best materials, it is, as at present official, a satisfactory product. No organisms have developed in the syrup, in any of the samples ; there is a slight, almost black growth in the diluted hydriodic acid from which the syrup was made, and this acid has developed a rather unpleasant odor suggesting stale water.

#### SYRUP OF ALMOND.

While the present official syrup is not like the 1890 preparation in its appearance, it possesses the flavoring qualities of the old syrup in a much more permanent form. Besides it is quickly and easily made at all seasons of the year. The sugar content is somewhat less than "simple" syrup, (about 100 Gm. less per 1000 Cc.) owing to the method of preparation in which 110 Cc. of flavoring, mostly orange-flower water, is added to enough syrup to make 1000 Cc. This could readily be overcome by adding the spirit of bitter almond and the orange-flower water to enough water to measure 450 Cc., and dissolving 850 Gm. of sugar in this liquid, finally making the volume exactly 1000 Cc. by the addition of water. The sample kept in a sterilized bottle, has developed, within 6 months, numerous small colonies of almost colorless organisms.

#### SYRUP OF ORANGE.

If the tincture of sweet orange peel were rubbed upon the talc, and the alcohol allowed to evaporate before the medicated water is made, it is believed that a syrup of much greater delicacy of odor and flavor would result. There is at present practically five per cent. of alcohol in the finished official syrup. The process is very satisfactory otherwise. The syrup is not one, however, which should be kept indefinitely, as the oil of orange rapidly loses its fineness of flavor, and a sample standing for over a year is not as pleasant to the taste as when it was fresh. None of the samples, sterilized or otherwise, have developed micro-organisms.

## SYRUP OF ORANGE FLOWERS.

Orange flower water, from which the syrup is made, as usually found in the store, contains an abundance of growth and care must be taken to obtain a water free from such organisms or the syrup will not be even relatively permanent. The solution of the sugar will be facilitated by the addition of enough orange flower water to make the contents of the bottle measure about 980 Cc., before agitating to dissolve the sugar, as suggested in the introductory remarks. The process and product are otherwise satisfactory.

## SYRUP OF CALCIUM LACTOPHOSPHATE.

The syrup has kept perfectly for more than six months, the only precaution taken being the use of good material and filtered water for the preparation and the rinsing of the bottles. The syrup is strongly acid but not unpleasantly so, especially when well diluted. A desirable modification is the use of 100 Cc. of water in rinsing the mortar, instead of 50 Cc. as official. This will be doubly advantageous in better rinsing the mortar and filter and also giving a larger amount of water for the solution of the sugar. The change is allowable since more than 50 Cc. of water must otherwise be added at the finish. It has been observed on several occasions that when the calcium carbonate was added to the lactic acid and water, and the contents of the mortar was in an active state of effervescence, the whole mass suddenly solidified, so solidly that the mortar could be inverted without spilling the contents or dropping the pestle. This mass readily dissolved, however, upon the addition of the phosphoric acid.

## SYRUP OF LIME.

The U. S. P. process is satisfactory. It required about 6 hours to filter the 1000 Cc. of syrup which is very light in sugar content. The evaporation of the 1890 process was unnecessary. It is important that a good quality of lime be used. One sample of syrup was made from an oyster-shell lime, which was in grayish scales or masses, and contained small, hard, black pieces. The syrup from this lime was of a yellow color.

## SYRUP OF FERROUS IODIDE.

The process is satisfactory as now official. A 1000 Gm. sample has been kept in a quart bottle for six months, with an air space above the syrup, and no special precautions taken to keep it, excepting that the bottle has been corked, and there is no darkening in color, even on the surface. It is noticeable that when the diluted hypophosphorous acid is added the syrup becomes slightly more yellowish in color.

## SYRUP OF PHOSPHATES OF IRON, QUININE AND STRYCHNINE.

Gentle heating seems necessary to dissolve the quinine as well as the soluble ferric phosphate, in preparing the glycerite from which the syrup



is made. Difficulty has been experienced in keeping the glycerite ; two samples, one made in the winter, the other in the summer, have both crystallized into a solid mass within a few days. Further work is being done upon this preparation.

#### SYRUP OF HYPOPHOSPHITES.

This is one of the syrups in which the solution of the sugar will be facilitated by the addition of enough water to make the product measure 980 Cc., before agitating to dissolve the sugar, as suggested in the introductory remarks. The difficulty of partial insolubility was experienced here as seems always to be the case when a solution of calcium hypophosphites is made. It is supposed that a portion of calcium salt is decomposed, during the evaporation and granulation, into an insoluble compound.

Although the samples were made as directed in the U. S. P., and the solution filtered before the sugar was dissolved, there has been some precipitate, after standing for eight months, of a white substance which adheres closely to the bottom of the bottles and will not shake into a mixture. All the samples have developed microscopic growths in abundance. This syrup and the compound syrup of hypophosphites are the most difficult syrups in the Pharmacopœia to preserve from such a growth. The sugar content in this syrup is very light, being only 650 Gm. to the 1000 Cc. of finished syrup. If a much larger amount is used, however, say 800 Gm. or 750 Gm. the sugar will force the hypophosphites out of solution because of the greater solubility of the sugar.

#### COMPOUND SYRUP OF HYPOPHOSPHITES.

The process for this preparation, as changed in the Additions and Corrections of the U. S. P., in which the water used to dissolve the calcium, potassium and sodium hypophosphites, was reduced from 450 Cc. to 400 Cc., produces a superior preparation. Here again, however, every precaution must be taken to avoid the introduction of mould organisms since the syrup is very difficult to keep free from their growth.

#### SYRUP OF IPECAC.

The official method is entirely satisfactory ; the syrup is clear and free from precipitate after standing about a year. This process is a model for syrups made from fluidextracts. By adding the fluidextract to the water, allowing it to stand 24 hours until precipitation has taken place, then filtering, dissolving the sugar in the clear filtrate, a syrup is obtained free from the cloudiness which invariably results when a fluidextract is added directly to "simple" syrup. There are a number of official processes which should be remodeled on these lines.

The precipitation resulting from the addition of the fluidextract to the

acidified water, seemed to be large. It was carefully collected upon a tared filter, the filter and contents dried and weighed. For 70 Cc. of fluidextract the precipitate weighed 0.8 Gm. and consisted of a dark-brown, resinous mass, which was insoluble, almost tasteless, and plastic when chewed.

#### SYRUP OF KRAMERIA.

This syrup, pharmaceutically, is unsatisfactory, although it may be efficient medicinally. The addition of so large a quantity of fluidextract to syrup (450 Cc. fluidextract : 550 Cc. syrup) could not be expected to produce a clear liquid. The proportion of fluidextract in the syrup could well be reduced to 250 Cc. of fluidextract in each liter of finished syrup. This would make the dose conform to that of the drug and fluidextract. The present dose of the syrup, 1 fluidrachm, is almost twice the size of that given for the drug and fluidextract, namely 15 grains and 15 minims, respectively. This would also produce a more pharmaceutical preparation. The fluidextract itself tends to gelatinize, due to the presence of so large an amount of tannin-like substances, subjected to, perhaps, the action of micro-organisms, and when the fluidextract and syrup are mixed, a coagulated mass, almost too thick to pour, results. As this syrup stands it separates into two layers, a clear, dark-reddish liquid above, and a cloudy portion, occupying about  $\frac{3}{4}$  of the bottle with a heavy precipitate at the bottom.

#### SYRUP OF LACTUCARIUM.

The U. S. P. directions state that, when the tincture of lactucarium is mixed with the orange-flower water, in which the citric acid has been dissolved, the mixture should be filtered if necessary. It was found impossible to filter the liquid, a small amount passing through the filter and the filter then becoming clogged by the precipitate which formed. Although the filter was changed a number of times this one sample was never successfully filtered and that which passed through the filter was no clearer than before filtration. One tincture was bought on the open market but now samples are being prepared from a tincture made in our own laboratory, strictly according to the U. S. P.

The syrup at best is an unpleasant and nauseous dose and in no way takes the place of the French proprietary preparation.

The addition of alkali, to render the resins soluble, as has been repeatedly suggested by pharmaceutical writers, cannot be considered, since it was shown many years ago by Aubergier, that the active principles of the lactucarium were destroyed in the presence of alkali.

The opiated syrup of lactucarium, of the French Codex, is doubtless an efficient sedative, but the U. S. P. syrup is little used and very unsatisfactory.

## SYRUP OF TAR.

The process for syrup of tar is an improvement over the syrup of the 1890 Pharmacopœia. The syrup can be made much more quickly and has a stronger tar flavor. As it stands, there is a tendency to darken, which was also true of the 1890 syrup. A slight deposit forms on the sides of the container after it has been made a few months, but the syrup itself remains clear. The process, as a whole, is very satisfactory. The mortar in which the mass has been triturated with the water, can readily be cleaned by a little alkali. It is important to see, however, that no alkali has been used in the mortar before making the syrup, for, unless it has been very carefully cleaned, this would render soluble a much larger amount of the tar than is intended.

## SYRUP OF WILD CHERRY.

The process should be modified in either one of two ways. As at present official the percolation is continued until the liquid in the receiving bottle measures 450 Cc. and then the sugar (700 Gm.) is dissolved in this, by agitation, without heat, and finally enough water added to make the product measure 1000 Cc.

The 700 Gm. of sugar will not dissolve in this amount of liquid since 150 Cc. of it is glycerin and only 300 Cc. is an aqueous percolate. It requires about 375 Cc. of water to dissolve 700 Gm. of sugar, and keep it in solution when cold. The one modification suggested is to continue the percolation until the liquid in the receiving bottle measures 550 Cc. This is permissible and will not make over 1000 Cc. of syrup when the sugar is dissolved. The other suggestion is the general one, which applies to a number of syrups; add enough water to make the product measure 980 Cc. before agitating to dissolve the sugar, finally adding water to make 1000 Cc. The Eighth Revision syrup is lighter in color and does not possess the astringency of the 1890 syrup. This is due to the glycerin being placed in the percolate as a preservative and not being passed through the drug with the menstruum. Since astringency is not desired the Eighth Revision syrup is to be preferred as its flavor is much finer. The keeping quality and appearance of the finished syrup is satisfactory.

## SYRUP OF RHUBARB.

The addition of the potassium carbonate changes the color of the fluid-extract from a greenish to a reddish tinge due to the action of the alkali upon the chrysophanic acid. The presence of this alkali probably renders the fluidextract more miscible with the syrup, since this preparation is the most satisfactory of those made by this process, namely the direct mixing of fluidextract and syrup. The official process is satisfactory.

## AROMATIC SYRUP OF RHUBARB.

With the exception of a ring of resin-like substance which has separated on the bottle at the surface of the liquid, this syrup is clear and satisfactory, pharmaceutically. The sample has stood about eight months.

## SYRUP OF ROSE.

This process, similar to the process for syrup of ipecac, again shows the advantages of such a procedure. The finished syrup leaves nothing to be desired, although, when the fluidextract was added to the water, a marked precipitate resulted, which, in the quick process of mixing syrup and fluidextract together directly, would have been present in the syrup. The syrup is of a beautiful red color and perfectly clear.

## SYRUP OF RUBUS.

This syrup illustrates the objection to the method of mixing a fluidextract and "simple" syrup directly. The bottle is one-third full of a brownish precipitate. The sample has stood without shaking for several months and the syrup has been made for about 8 months. The process should be modified if a suitable pharmaceutical preparation is to be obtained.

## COMPOUND SYRUP OF SARSAPARILLA.

This syrup is as striking an illustration of the value of a proper pharmaceutical process, as is syrup of rubus, of the disadvantages of not following such a method. The fluidextracts were allowed to precipitate when mixed with water, the precipitate filtered out and the sugar dissolved in the clear filtrate. The syrup is clear, free from precipitate and pharmaceutically perfect.

## SYRUP OF SQUILL.

The Eighth Revision process produces a perfect syrup which keeps well and does not precipitate. The change made in the 1890 process for vinegar of squill, that of boiling and filtering, to free it from albuminous substance, is very desirable. In the 1890 syrup this had to be done whenever the syrup was made; now the whole lot of vinegar is treated at once, and the syrup may be prepared without any such preliminary step.

## COMPOUND SYRUP OF SQUILL.

The fluidextract of squill, which is used in this preparation is now made with an acetic acid menstruum, and contains no alcohol. In the process for the syrup, however, the mixed fluidextracts, measuring 160 Cc., are directed to be evaporated to 100 Gm., presumably to remove the alcohol. There is present, however, only about 40 Cc. of alcohol, from the fluidextract of senega, which would weigh about 33 grammes. It was found to be difficult to evaporate the mixed fluidextracts to 100 Gm., at a low

temperature and certainly required much more heating than should be used. Evaporation should be continued until the mixed fluidextracts weigh about 130 Gm., if the evaporation of the alcohol is necessary, but why should the alcohol be removed at all? Many syrups contain from 2 to 5 per cent. of alcohol.

In six months the finished syrup has precipitated badly; a fine, slimy deposit has formed in the bottle, which mixes readily, producing a cloudy syrup. This may be the albumen-like principle, from the fluidextract of squill, and it may be found necessary to heat the fluidextract to boiling, and then filter it to get rid of this substance which afterwards precipitates.

#### SYRUP OF SENEGA.

This syrup is another example of the bad results obtained from mixing fluidextract and "simple" syrup directly. It is filled with a flocculent precipitate which renders the preparation unsightly and unsatisfactory pharmaceutically.

#### SYRUP OF SENNA.

This syrup is subject to the same criticism offered in the case of syrup of senega. It is cloudy, has precipitated, chiefly upward, and is not a good preparation pharmaceutically.

#### SYRUP OF TOLU.

The process is satisfactory. The one question which may be raised is, Should not the alcohol be allowed to evaporate before the medicated water is prepared? This was done in the 1890 process and produced a syrup free from the taste of alcohol. The use of the official tincture of tolu is a great advantage over the extemporaneous preparation of a tincture of tolu, every time the syrup is made, as was directed in the 1890 process.

#### SYRUP OF GINGER.

This process is satisfactory and is another example of the advantage of a method for freeing the finished syrup from the precipitate, which is certain to follow the dilution of a fluidextract with an aqueous medium.

Discussion was invited upon the paper just read.

Mr. Payne said that in regard to the last paper presented, a vote of thanks was due for what was certainly one of the best papers on the subject he had ever heard. In his section of Georgia, the keeping of syrups and the prevention of crystallization are very serious matters. In that State, while they make but little sugar, they make a great deal of syrup, and the pharmaceutical chemist was constantly referred to in regard to these points. The percolating apparatus sold throughout the country and used so generally by pharmacists is very successful in its work, and the author of this paper seems to have proven that to be the best method of

making syrups. The process of percolation really caused the bottom layers of sugar, as well as the paper and whatever is at the bottom, to produce a very thorough filtration, and if there are any bacteria or any fungus growths in the syrup they would form a filtration medium also, and then the syrup is free from these substances that produce fermentation; consequently, percolation, on that account seems to give a better keeping syrup than heat. Another feature introduced here is the aseptic condition of all the vessels used, which is a very important thing in the making of syrup. The cane sugar that they use—sugars like A. B. C., and coffee sugar—contain considerable impurities, while the beet sugars are only put on the market in the higher grade. The cane sugars have a very pleasant taste, but they do not keep well. They have found that no matter how pure the syrup, the cane sugar crystallizes out, and they have adopted the process of producing a certain kind of converted sugar, that prevents the crystallization in large degree, and that means a good deal in the manufacture of syrups on a large scale.

Mr. Good said that syrup of lactucarium was here criticised, and inasmuch as that formula was put into the Pharmacopœia at his suggestion, it seemed to him he was put on the defensive. On reading Mr. Cook's paper, he of course felt that it was necessary to examine his syrup of lactucarium on the shelf. It was made several years ago—there is no active demand for lactucarium—and it has not changed in that time, except as one would expect a syrup to change with age, without spoiling; there is so much glycerin in it that there is no danger of spoiling. It has become somewhat darker and lost some of its fine flavor, but that was to be expected; but it is still a nice, palatable syrup, and one he would not hesitate to put into a prescription. The formula is exceedingly simple, and the syrup may be mixed in five minutes, and he has had no trouble with it. The whole trouble comes in not properly preparing the tincture of lactucarium. The tincture properly prepared, a good, satisfactorily finished tincture, with no odor of benzin left in it after percolation, mixed with glycerin, first, and the orange flower water added, gives in a few minutes a perfectly beautiful, finely flavored syrup. He had never seen the slightest objection to it, and it costs a great deal less than Aubergier's syrup of lactucarium; he regarded it as of more value medicinally, and it was certainly palatable. Why Mr. Cook should have had such unpleasant experience with it he could not understand. He thought perhaps Mr. Remington could explain that.

Referring to syrup of krameria, Mr. Good thought the criticism well taken; he did not know why it was in the Pharmacopœia. He could not recall, that in an active business career of many years, he had ever had occasion to dispense it.

Mr. Ladish said the author of the paper spoke of syrup of lactucarium as not being exact, or as not coming up to the Pharmacopœial require-

ments. He had had some experience with lactucarium, not Aubergier's syrup; the latter is not a syrup of lactucarium at all. The way he got around lactucarium to make it look better, was to simply filter it through a white filter. He obtained a perfectly white mixture, and the last batch he made was allowed to stand for a few days, and then filtered, and he had had that for as long as four months, and had shown it to several physicians, who used it in children's cough mixtures.

Mr. Dunning called attention to one statement in Mr. Cook's paper which had not been in accordance with his own observation, and that was that upon the addition of hypophosphorus acid to syrup of ferrous iodide it becomes slightly more yellowish in color. His experience was that it cleared it up and made it a very pretty green. He did not know that this was important, but that was his observation.

Mr. Sayre, speaking with reference to syrup of lactucarium said, that, while somewhat out of the order of discussion, he was reminded of the idea brought up in another Section in regard to the therapeutic action of preparations. It was stated in that meeting that neither this Association nor any Section of the Association had any right to go into that matter of therapeutic action; in other words, that it was indelicate for the Association or any Section to discuss therapeutic activity. It seemed to him, however, that here was a case where the pharmacist would like to know the status of lactucarium from this very standpoint. He thought pharmacists have avoided discussing these things through modesty, but he thought they should be matters of investigation, and that pharmacists should at least be familiar with the status and opinions with regard to these preparations. It was well known that Aubergier's syrup was not a syrup of lactucarium. When he went to Philadelphia and went into business years ago, he made a syrup of lactucarium by the gallon, and it was used in place of opium preparations by such eminent physicians as Dr. S. Weir Mitchell and Dr. Agnew and others. The question now is, Has it actually become obsolete? Is it now considered of no value, therapeutically? It seemed to him this was a fair question for pharmacists to ask, and might be brought up without hesitation or indelicacy.

Mr. Hallberg, continuing the discussion, said he thought that the pharmacist should be very careful in selecting his materials for syrups. They should also take into consideration the effects of heat, and how syrups should be preserved after being prepared. Formulas may be unsatisfactory, unless these conditions are taken into consideration. He appreciated the value of making them by the cold solution-process—misnamed "percolation." He had obtained a clear, transparent syrup by that method; but if there be any bacteria in the sugar, as there is likely to be if exposed, and no heat is used, these bacteria will develop on coming in contact with air, and the syrup will quickly spoil. When made in large quantities and disposed of quickly, he believed this was a good method, but for most

pharmaceutical syrups he believed they should be made by the hot method. This method he had followed for a good many years, based upon bacteriological conditions. The water is brought to the boiling point, and as the water boils the sugar is poured in and the mixture constantly stirred, the heat continued, and when the sugar is all dissolved the syrup is brought to a boil. In that way any bacteria which may be present in the sugar are destroyed, but care should be taken not to apply so much heat as to cause the sugar to become inverted. It is necessary to prevent the inversion of sugar, because inverted sugar will soon cause fermentation in syrups. After being prepared in this way, the syrup is filtered through paper. This should be a large gray filter—about 55, he believed; and it is desirable to use a funnel with a wide neck, so that the operator can push the point of the filter paper down into the neck of the funnel. In that way half a gallon of any of the syrups may be filtered—if it does not contain much glycerin—in the course of two or three hours. It should be carefully covered, of course.

The preservation of syrups is really where the pharmacists are weakest. This idea of keeping a whole shelf-full of bottles, some of them better suited to keeping lubricating oil than syrups, is preposterous. The regular syrup bottles are not desirable. The simple syrup of ginger, or the syrup of tolu will keep, but nearly all the others—the krameria syrup, the lactophosphates, the hypophosphites, etc., should be put in sterilized bottles—preferably eight-ounce bottles—and filled up to the cork, and then put in a cool place; not a cold place, of course, but a cool place. The ordinary bottles should be used, because it is absolutely necessary, if you want the syrup to keep, that the bottle should be sterilized, and you cannot sterilize a glass-labeled bottle without melting the label off the bottle. Mr. Hallberg said he would call the attention of the druggists to the absurdity of making fine syrups, and then having them stand by on the shelves and spoil, having to be thrown away, or used when they should not be used. Make them properly, he said, and then keep them properly after they have been made.

Mr. Good asked Mr. Hallberg why he used a gray filter paper, and Mr. Hallberg replied that it was a little thicker, and syrups filtered more easily, in his experience, through gray than white paper. Mr. Good remarked that he had been in the habit of regarding the gray filter paper as not as pure as the white, and therefore objectionable on that account. Mr. Hallberg said that this might possibly be true.

Mr. Hallberg then spoke of the exhibit made by the Chicago Branch at the meeting of the American Medical Association in June last, containing a number of these syrups, lactophosphates and hypophosphites, etc., which were exposed there in a very hot place, but which were afterward shipped thirteen hundred miles out to Glenwood Springs, Colo., and were in good shape there. These syrups were practically all made by this method of filtering through paper.



Mr. Searby emphasized the paper with regard to getting the right kind of sugar. He said that in California they were far enough away from some of the centers of commerce to make it difficult to get some things; but they had no difficulty in getting good sugar; but notwithstanding that fact, druggists had told him repeatedly that they could not buy a good article of granulated sugar for making syrups. That was when granulated sugar was made to look whiter than the pure sugar by the introduction of ultramarine; but sugar now is as white as it looks. The ordinary granulated sugar is not pure enough for the making of syrups. Confectioner's A sugar costs only about a quarter of a cent a pound more, and the man that cannot afford to pay five dollars for a hundred-pound sack of good pure sugar is a mighty poor pharmacist, in his estimation. The confectioner's A sugar is not quite equal to some which has been crystallized, such as the crystal A sugar referred to by author of the paper; but it is a very fine sugar. Another sugar they have out there is the sugar diamonds that they make in Vancouver, British Columbia, which is a very beautiful and fine sugar, and comes in crystals about the size of split peas. The suggestion of Mr. Payne about the introduction of inverted sugars he thought was out of the question.

Mr. Payne responded to this that it was not his suggestion, but he had stated that it was used in the manufacture of large quantities of syrup.

Continuing, Mr. Searby said that there was nothing to compare with what is commonly known as "cold percolation" for ordinary syrups. He always had two or three gallons of saturated syrup on hand. The only trouble was that this syrup was about four per cent. stronger than the syrup of the Pharmacopœia, and they had to reduce it slightly by the introduction of a little water. That introduced the element of possible decomposition, but he had never had any trouble from that source. The danger of having the syrups decompose is not great, when you have them fully up to the strength of the U. S. P. One of the greatest difficulties is to get the clerk to go to the trouble to take the specific gravity of a simple syrup to see that it complies with the Pharmacopœial requirements; he had tested the work done by his clerks time and again, and often found the syrup was too light or too heavy, as the result of such carelessness. He always had plenty of good syrup ready for use, and had never had any trouble with decomposition, either with that or the syrups made therefrom.

Mr. Searby said he had had trouble with syrup of wild cherry. He had noticed one day that, very unwisely, these syrups had been exposed to the light of the store—not the sunlight, but to such light as was in the store-room. In a four-pint bottle of wild cherry, about three-fourths full, he noticed it was cloudy and, upon examination, he found it had no taste of anything but sugar; it had become absolutely devoid of its characteristic prussic acid flavor, and had become worthless as a syrup of wild cherry. That condition, of course, indicated that some kind of fermenta-

tion had taken place. Probably the lack of density of the syrup had caused the introduction of the growth of bacteria, which completely destroyed the constituents.

Mr. Francis Hemm, of St. Louis, said that he was interested in Mr. Hallberg's statement about the preparation of syrups. In 1875-6 they had threshed pretty well over the two proposed methods for syrups of the Pharmacopœia, namely, the hot process and the cold process. It was just about the time when the pharmacists of Texas were advocating the cold percolation method, when they took up the matter in the alumni association of the St. Louis College of Pharmacy, and had gotten up a few experiments based on the two processes; this series of tests went through practically the whole year. They appointed advocates of the hot process and advocates of the cold process, who were to make preparations by both processes and expose them to time and ordinary drugstore conditions, to determine their permanency. After prolonged discussion of the matter by the members of the Association, they came to the conclusion that Orinsky's process of cold percolation was the best adapted to pharmacists, because it always insured saturated syrups, and in any climate. It makes quite a difference as to the climate in preparing your syrups when it comes to the proportions of water and sugar. In the Southern States you need more sugar than in the Northern States. You want just enough sugar to saturate the water at whatever place your drugstore is located. When you succeed in doing this you have a syrup that has the most permanent qualities. We found that the syrups made by the cold-percolation process kept best under the Pharmacopœia of 1870, and we finally voted in favor of cold-percolation. Shortly after that time, in 1880, the Pharmacopœia adopted the cold method of percolation. His experience as a retail pharmacist, always actively engaged in the business since that time, had been that syrups made by the cold-percolation process had always kept the best and given the best satisfaction. Of course there are certain exceptions to this rule, as there are always exceptions to any general rule. He had made considerable syrup of lactucarium by that process, and it had never given him any trouble. Syrup of wild cherry had never given him any trouble, except as Mr. Searby had indicated.

A point that he wanted to draw attention to that had been entirely overlooked on the question of sugar, was this: Attention had been called to the presence of moisture and bacteria in the sugar used. He thought the average druggist gets these products or substances with his sugar, and if he would take the precaution to get crown A. sugar, or crystal A. sugar, both of which are excellent grades of sugar, and weigh so many grams of it with so much water, he would get a thoroughly saturated syrup. When the pharmacist goes to the grocery store and gets his granulated sugar, he probably gets wet or at least moist sugar of variable degree, and of course if your syrup is not thoroughly saturated, you are going to have

fermentation. In the syrup of orange peel of the present Pharmacopœia, as well as the syrup of ginger, the small amount of alcohol introduced into that syrup, leads to the souring of the syrup. Complaint has been repeatedly made about that since the new Pharmacopœia came out. He had seen syrup of ginger getting moldy under the present process.

Referring to the matter of the retail pharmacist's convenience, Mr. Hemm said that he preferred the formulas of the Pharmacopœia so constructed as to give him these syrups without so much trouble and at less expense. He wants, if he can get it, in order to make the Pharmacopœia process popular, formulas for making these preparations extemporaneously, so as to have them fresh. What is the use of arguing about the keeping qualities of syrup of acacia, for instance, with the pharmacist who only has an occasional demand for it, when he can make his syrup of acacia, or mucilage of acacia in a few minutes? And so with other syrups. Many of these can be made extemporaneously by simply adopting other methods. Formulas of this kind will answer his purpose admirably. The experienced pharmacist will take advantage of all these points brought out in these papers, but the average pharmacist, doing an average prescription business, probably does not think of them at all. But formulas for extemporaneously making these preparations, if pointed out to him, will be welcome to him. He thought the popularity of the formulas of the Pharmacopœia should be increased wherever possible.

Mr. Hallberg asked Mr. Hemm if he meant by "extemporaneous formulas" something like that monstrosity that we have, "syrup of almond." There is an attempt at an extemporaneous formula for you! said Mr. Hallberg. Mr. Hemm responded that it ought to be made from almond, and not essence of almond.

Mr. Wilbert said he had had some experience with syrups—an experience covering some twenty-four or twenty-five years—and he would say that the syrups of the United States Pharmacopœia were the most permanent and elegant preparations in that book; there was absolutely no question of their stability if made properly and kept properly. He admitted that he had had experience with these syrups spoiling for the first five or six years, and he wondered how it was; but after he had learned something about bacteriology, he knew how it was, and in the last eighteen years he had not had a single ounce of syrup to spoil. With ordinary precautions to prevent infection he said there was absolute permanency. He had used the cold process in a glass percolator, and saw that everything pertaining to the process was carefully guarded from infection. He also used the best quality of granulated sugar he could get; sugar is an antiseptic in itself, but he was careful to guard it from infection. He insists on the use of distilled water, and said that if that was used, and care was taken to keep free of infection, the syrups would keep perfectly. He thought pharmacists should learn more about bacteriology, and they would have less trouble with preparations of all kinds.

As to the syrup bottles that Mr. Hallberg criticised, Mr. Wilbert thought the objection was not well taken. A syrup bottle properly protected, by having the neck of the bottle well covered, is all right, and gives no trouble by way of infection, and the syrups will keep without trouble. As to syrup of mucilage of acacia, he still uses the mucilage of 1890, and makes his syrup of acacia from that. For many years past they have kept their mucilage of acacia in a refrigerator and have never had any trouble with it. The idea is to keep it at a low temperature, and you will always have it fresh.

Mr. Hallberg asked Mr. Wilbert if he had found it necessary to have the container sterilized that he put his syrups in. Mr. Wilbert replied that of course care had to be taken to see that no objectionable micro-organisms were contained in the bottles, and to keep them ordinarily clean. Their method was simply to wash out the bottles thoroughly with soap and water, then rinse with hot water and then with distilled water, which was all they had found it necessary to do. Mr. Hallberg asked what became of the glass labels on the bottles, to which Mr. Wilbert responded that they did not use enough hot water to remove the labels. Mr. Hallberg thought if this was the case that it was impossible to have the container thoroughly sterilized.

Mr. Payne thought the use of sterilized water and the washing of all the vessels made a wonderful difference. Outside of the use of any antiseptics, it made a wonderful difference in the keeping quality of all syrups.

Mr. Dunning said that in his experience he had found that the busy pharmacist did not want to take the time to make any more preparations extemporaneously than he had to. He did not think it feasible or desirable to have formulas for making syrups extemporaneously if it were possible to make them so they would keep.

Mr. Ladish said he wanted to bear testimony to the statements made by Mr. Hemm; his experience had been identically the same. The umbrella-shaped top to a syrup bottle he would not have as a gift, he said.

Mr. Beringer here moved to refer all the papers presented to the Section to the Publication Committee, to save time. Mr. Hallberg said that this might do, unless there was some objection to be made.

The Chair stated that the next paper was one by Valentine Schmidt, of San Francisco, who had sent some samples of his rose water ointment for inspection of the members. He stated that in the absence of the author the paper would be passed.

Mr. Searby explained that the point that Mr. Schmidt made in regard to the cold cream was this: That the real secret of making good cold cream is in having the temperature just right—the temperature when the water is introduced into the oil or fatty body. That was the secret of his nice cream, which he said was very beautiful. The full text of the paper here follows:

UNGUENTUM AQUÆ ROSÆ.

BY VAL. SCHMIDT, SAN FRANCISCO, CAL.

The formula for the official rose water ointment is a good one, and answers nearly all pharmaceutical requirements. There are, however, in my opinion, several objections to it, to wit: Its cost and its instability, especially in hot weather.

Pure oil of sweet almonds is scarce and expensive, costing from 65 to 75 cents per pound, which is an inducement to an elastic conscience to substitute oil of peach kernel or some less costly vegetable oil still more objectionable. The danger of using a rancid ointment in a prescription is too well known to be repeated, which is apt to happen when cold cream made with a vegetable oil is kept in stock any length of time.

I would suggest as a substitute for oil of sweet almonds the *pure white* Russian mineral oil, and for rose water, distilled water and otto of roses.

The following formula has been in use for a number of years in my business and has given perfect satisfaction, pharmaceutically as well as commercially.

I have found that the quality of the ointment depends largely upon the *modus operandi*.

If the following formula is used, and the directions for compounding are carefully followed, an excellent result will be obtained:

White wax, spermaceti (of each  $5\frac{1}{2}$  ounces); Russian mineral oil, pure white (30 ounces, troy); distilled water (12 fluid ounces); pure borax ( $2\frac{1}{2}$  drachms); otto rose (30 drops).

Melt the wax and spermaceti over a slow fire in a large porcelain evaporating dish; tare, and weigh the oil into it; then apply a gentle heat until clear. Dissolve the borax in the distilled water, previously heated to  $150^{\circ}$  F.; allow the wax, spermaceti and oil to cool to about the same temperature; add the solution of borax *all at once* and stir briskly for a few minutes, then add the otto of roses, continuing the stirring until cool.

When thus prepared it is a snow-white, elastic, creamy-looking ointment, which will keep almost indefinitely, and costing about 18 cents per pound.

This cream may be poured into suitable containers while still quite warm without impairing its texture.

The Chair stated that a paper by Miss Charlotte E. Stimson, of Chicago, on "Massage Ointment, or Toilet Cream," was along the same lines as the paper just submitted. The author was not present, and the paper was simply read by title. The full text of the paper here follows:

## MASSAGE OINTMENT, OR TOILET CREAM.

BY CHARLOTTE E. STIMSON, PH. G., CHICAGO, ILL.

A most excellent massage ointment or "cold cream" may be obtained from the following formula. It makes a white creamy ointment, which keeps well.

White wax.....	250.00
Paraffin oil .....	500.00
Borax.....	2.00
Rose water.....	75.00
Orange flower water .....	75.00

The Chair next called for a paper entitled "Notes and Suggestions on the Cerates and Ointments," by Mr. J. M. Good, of St. Louis. Mr. Good presented his subject as follows:

## NOTES AND SUGGESTIONS ON THE CERATES AND OINTMENTS.

BY JAMES M. GOOD.

Except in one or two cases nothing radical by way of changes in the formulas for ointments is intended. For the most part they seem to give quite general satisfaction. Suggestions in manipulation seem to me to be in order.

## CERATE.

Simple cerate might be prepared by the substitution of paraffin for white wax.

Paraffin, more readily than wax, will form a smooth mixture with white petrolatum, and the product is not quite so likely to become rancid in a short time.

## ROSIN CERATE.

In preparing this cerate, after melting the ingredients together the instructions are to allow the mixture "to congeal with occasional stirring."

My observation is that the product is more likely to be smooth if allowed to cool, undisturbed.

## PETROLATUM.

During the summer months the druggist may find it necessary to raise the melting-point of petrolatum. This is readily done by the addition of a small amount of hard paraffin. Before the process of refining these substances were associated in one intimate mixture. In bringing them together again each comes to its own. Melt them together by the employment of a moderate heat, strain if necessary, and allow the mixture to cool without stirring.

Agitation produces a granular product.

## CHRYSAROBIN OINTMENT.

The instruction to strain this ointment is indefensible whatever way you look at it. It is a concession to the indolent and careless manipulator and removes from the product its only medicinal constituent. No ointment should ever be strained; it should never need straining except to remove accidental admixture of foreign matter from the fatty vehicle.

An ointment entirely free from grittiness may be prepared by first triturating the chrysarobin with an equal weight of liquid petrolatum until a perfectly smooth mixture results, then incorporate this with the benzoinated lard.

## DIACHYLON OINTMENT.

The official process yields a good product; unfortunately it is unstable and soon becomes rancid.

Hence we are told "It should be prepared extemporaneously."

In an experience of many years I have dispensed a great deal of Diachylon Ointment. My formula for preparing it is:

Take of lead plaster.....	50 parts.
Oil of lavender flowers.....	1 part.
Petrolatum.....	49 parts.

The official manipulation may be followed in its preparation.

In consistency it is entirely satisfactory and it may be kept indefinitely without showing any appreciable change.

## OINTMENT OF MERCURIC NITRATE.

The preparation of citrine ointment has always been more or less of a problem.

The official process yields a satisfactory product but unfortunately the ointment soon becomes too hard to be miscible with other fatty bases unless it be melted. Without suggesting that such a formula be made official I call attention to the fact that citrine ointment made with petrolatum as a vehicle is not liable to the undesirable change aforementioned. It is an ointment of mercuric nitrate but it does not contain elaidin.

This latter fact does not detract from its medicinal value, however.

The formula which I have used in preparing this ointment is the one given out by the Chesebrough Company some years ago.

It is as follows:

Take of mercury.....	6 parts.
Nitric acid.....	10 parts.
Yellow wax.....	28 parts.
Petrolatum.....	56 parts.
Total .....	100 parts.

Dissolve the mercury in the nitric acid without heat.

Melt the wax and petrolatum together by the heat of a water-bath. Allow this mixture to cool to 130° F.; add the mercuric nitrate solution and stir the mixture constantly, with a wooden spatula until the ointment thickens. Afterwards stir it occasionally until the reaction ceases. The ointment is smooth, of good consistency, an orange red color, and remains comparatively soft for an indefinite time.

The orange color would still justify the name "citrine ointment."

#### OINTMENT OF YELLOW MERCURIC OXIDE.

In preparing this ointment it is entirely unnecessary to triturate the mercuric oxide with water. This oxide is described officially as an "amorphous, heavy, impalpable powder." We may go farther and say that it exhibits "no evidence of crystalline particles even under the microscope."

Therefore, in preparing the ointment, omit the water.

#### TAR OINTMENT.

To prepare a satisfactory tar ointment requires patience and persistency. Follow the official formula and manipulation. In my experience I have found it necessary to remelt and strain the ointment two or three times in order to obtain a product which would remain permanently smooth. After each melting there would remain a resinous deposit in the bottom of the evaporating dish. Care must be taken not to disturb this when stirring the mixture.

#### OINTMENT OF ZINC OXIDE.

In preparing this ointment be careful to select an oxide of zinc which is entirely free from gritty particles. Have in the laboratory, for such work, a good-sized marble slab and two or three large, rather stiff, spatulas. Rub the zinc oxide on the slab with an equal weight of almond oil until a perfectly smooth product results. Take a lesson from the mixer of paints as he grinds white lead and oil by the use of the slab and muller. Be persistent and do not cease work until your product compares favorably with his. This accomplished, incorporate the lard, without melting, by mixing and rubbing upon the slab. Such an ointment will not need straining, and the manipulator should not be allowed to entertain for a minute the idea that such action would be permissible.

For summer use the ointment would be too soft. To correct this objection the lard should be stiffened by the addition of a proper amount of white wax.

Mr. Searby asked Mr. Good whether he had any special preference for almond oil when mixing with the zinc oxide; whether he would not rather have had a mineral oil—one of the paraffin oils, that does not become rancid in any sense after keeping, which even a good almond oil, after a



time, is apt to do. Mr. Good responded that he would prefer paraffin oil, but he had been in the habit of using almond oil, because it did not become rancid so soon as olive oil and others.

With regard to the preparation of tar ointment, Mr. Searby said he had made a great deal of it, and the greatest difficulty was to get a good tar: Tar perfectly uniform and semifluid should be used, if it was possible to get it. A great difficulty in making tar ointment is to avoid too much heat. By heat some of the constituents of the tar become changed into a granular body, which never becomes dissolved in the fat. By keeping the temperature very low—just as low as necessary to get a perfect mixture with the suet and other bodies,—you can accomplish the object; and Mr. Searby said he had never found, when it was made, that it was necessary to strain it, or do anything with it afterwards, and he had kept it for a year and over.

Yellow oxide of mercury ointment, notwithstanding the Pharmacopœia says it is an impalpable powder, we find it is not always easy to get that oxide in a sufficiently divided condition—yellow oxide of mercury. There is an oculist in San Francisco who allows only two or three firms to prepare his yellow oxide of mercury ointment. Mr. Searby said that he had prepared that for him specially, and that it had seemed to be very satisfactory. The fact of the matter is, that these oxides prepared by precipitation will precipitate in form of an impalpable powder, and yet not be in an impalpable powder when you get them from the manufacturer. The yellow oxide of mercury must be rubbed down with something before mixing with the ointment base. Some rub by a spatula on a slab, with a little oil, and others use a little water. A most satisfactory ointment of yellow oxide of mercury has been made by never allowing the oxide to become dry—that is to say, by using mercuric chloride, in just sufficient quantity to precipitate the required amount of mercuric oxide; washing that thoroughly, separating by collecting it on filter paper, and when it is as dry as it can be got without heat,—use no heat whatever,—and while it is still in a plastic condition, but thoroughly washed so that it gives no reaction for chloride,—you add the required amount of fatty body, and then you do have the oxide present in an impalpable powder.

Mr. Hallberg said he was very much interested in this question, because we were all interested in the present formulas of the Pharmacopœia; and he appreciated very much the paper and the criticism offered, because it was the most complete, probably, that has been offered since the Pharmacopœia appeared.

The cerates contain petrolatum, as such, thirty parts, which was as much as was thought would be desirable for it to contain, which represents the paraffin idea recommended by Mr. Good. As for the bringing of petrolatum to a firmer consistency by melting it with paraffin, that is desirable, but great care must be used in order that ozokerite, which is very often

substituted for paraffin, is not employed because such earth wax will not make a homogeneous solid, but becomes granular.

Mr. Good suggested that the paraffin now sent out by the Standard Oil Company—"since that Chicago judge got after them"—could be relied upon.

Mr. Hallberg said he had tried several vehicles for chrysarobin ointment, but always found that a portion of the chrysarobin remained undissolved; it was therefore thought desirable—and he believed the suggestion came from Mr. Caspari—to take 20 per cent. more of the chrysarobin, and then strain the mixture with the liquid in order to free it from this insoluble matter, supposed to be inert, and to leave practically five per cent. of chrysarobin represented in the ointment.

With reference to diachylon ointment, he was glad to hear Mr. Good state that he has been using that combination for so many years, to the satisfaction of able dermatologists. There is no question that petrolatum is a proper vehicle for diachylon. Some of the committee got the opinion of the best dermatologists in this country on that subject, and they favored it, but the committee would not entertain the idea. It may be readily understood that lead plaster, when it comes in contact with animal or vegetable fat, is bound to cause it to become rancid. In diachylon ointment you do not want penetration in the skin; you want to avoid lead poisoning from the diachylon ointment. The petrolatum carries the external effect of the lead, and therefore, it is the logical vehicle, and will keep for any length of time, while animal or vegetable fats will not.

As for the nitrate of mercury ointment, Mr. Hallberg said he thought Mr. Good's criticism was correct, but his experience indicated that petrolatum alone was not desirable; that by mixing the solution of mercuric nitrate with woolfat and then incorporating with the petrolatum, he had obtained a citrine ointment that was a golden-yellow ointment, and which had kept in tin boxes for five years, without even the slightest discoloration of the box, as the ointment caused no reaction. It contains mercuric nitrate, which the physician wants. In animal fats mercuric nitrate will not keep, it will be reduced to mercurous nitrate.

As to the yellow mercuric oxide ointment, the method of using freshly precipitated mercuric oxide, as in the original Pagenstecher formula, is unquestionably the best, but the method is too complicated, and therefore the official process is merely an alternative, to triturate the yellow oxide of mercury with water in order to get it as close as possible to the desired condition, and then it is mixed with the woolfat and petrolatum. In this way you can get a perfectly smooth ointment.

Dermatologists in Chicago are just as particular as they can be. They examined this ointment even with a microscope, although some of the stores in Chicago seem to make it by taking a little petrolatum, adding a few grains of yellow oxide of mercury in a box and stirring it around (Laughter).

In zinc ointment there is no need of sifting the zinc oxide. If you have a fine zinc oxide triturate it with the liquid lard, strain through gauze and you will have as fine an ointment as can be made. Petrolatum and zinc oxide do not go together according to his experience.

Mr. Osseward, of Seattle, said, in regard to the yellow oxide of mercury, that he had had the same experience as Mr. Searby. He made it fresh by precipitation, and it never hardens, and they are perfectly sure of having a smooth ointment. He went to his physicians and said "I have got some of this ointment, and I want you to see it." He put some on a slide and let them look at it through a microscope, some of this ointment made in the usual way; and they had found it quite satisfactory.

The General Secretary said he believed that people would differ as long as men were alive. He was sorry to hear from his good friend, who had read the paper last presented, that the direction of the Pharmacopœia to strain chrysarobin ointment was indefensible. He wanted to defend that formula right now. He went on to say that this ointment was introduced into this country from England, if he correctly remembered, and the British Pharmacopœia states that chrysarobin is entirely soluble in hot chloroform and almost entirely soluble in hot 90 per cent. alcohol. Mr. Boa of England some years ago recommended the use of warm or hot vaseline, in which chrysarobin was said to be perfectly soluble. He went to the trouble of obtaining different samples of chrysarobin, as many as four or five, and tested them all with the result that not one was completely soluble in any solvent, as far as his experience went. Then he followed the plan of ascertaining the amount of insoluble residue, and based on that a formula was constructed, with the proviso that the insoluble portion be strained out. The fact that chrysarobin is partly insoluble, and leaves more or less of an insoluble residue in the ointment, is a decided objection to those who use it and makes straining of the ointment imperative.

Zinc oxide ointment, Mr. Caspari said, he had had no difficulty in making smooth. He used a large dish in which the lard, or lard and wax, are melted and added Hubbuck's oxide of zinc previously sifted through a bolting cloth.

Mr. Caspari said that after having strained the fats and added the zinc oxide, the mixture should be stirred until the danger line is passed, that is, until a creamy condition is reached. The Pharmacopœia contemplates the making of 100 or 500 (grains) by the retail pharmacist. He thought the large manufacturers were in the habit of using paint-mills for making zinc oxide ointment.

Mr. Good said his clerks understood that no ointment was ever to go out of his store that contained a particle of grit in it, and, therefore, they are expected to triturate the chrysarobin with paraffin oil, and the finished product is absolutely smooth; therefore, there is no necessity for straining.

As regards the zinc oxide, he used Hubbuck's only, but had never been able to make an absolutely satisfactory smooth ointment, except by manipulation, imitating the painter with his slab and muller. There is not a particle of zinc visible by smoothing it out very thin, and examining it carefully. Mr. Caspari suggested that this was the whole secret, of course, and Mr. Good agreed with him.

Mr. Dunning gave his experience in making oxide of zinc ointment in comparatively large quantities; that is, say, five or six pounds at a time. It was similar to that of Mr. Hallberg, except it differed in this respect: The benzoinated lard is melted and thoroughly triturated in a large mortar with the zinc oxide, which has previously been bolted; the mixture is allowed to stand sufficiently long to allow any heavier particles to subside; the lighter portion is then poured off and the remainder rubbed to a smooth paste.

This is repeated until every particle is broken up, the whole is stirred until cool. The whole procedure is similar to that followed in mixing insoluble powders with water; bismuth subnitrate, for instance, should be triturated thoroughly to break up all lumps and then mixed with water, the heavier particles allowed to settle; then the smooth mixture should be poured off, the heavier lumps broken up, and mixed again with the lighter homogeneous mixture, etc.

As to mercuric oxide ointment, he had collected a large number of samples for observation with reference to keeping qualities, and also had examined them under the microscope with reference to distribution, and had experimented for a number of years on the best diluent for this substance in the form of an ointment. His conclusions were that petrolatum was the most satisfactory. There should be no moisture present. He found only one method for thoroughly distributing yellow oxide of mercury. It must be in a fine powder which contains no lumps—or crystals—it should be bolted. It should be rubbed on an ointment slab, with just sufficient oil—petrolatum oil, preferably—to make a thick paste which is spread out over the surface of the slab until it is very thin, as thin as it is practically possible to get it. The thin smear—(as it might be called) is then diluted with more oil and scraped together and mixed with petrolatum. He had found that when the yellow oxide of mercury ointment was prepared according to the fresh precipitation method, the mercuric oxide was finely divided, but when examined under a microscope, although no crystalline condition was observed large clusters of particles were.

Mr. Wilbert said there was no ointment that oculists were more disappointed in than yellow oxide of mercury. There are very few pharmacists, indeed, that know how to prepare the yellow oxide of mercury ointment. One trouble is that the United States Pharmacopœia ointment is entirely too strong. A majority of the oculists, in his experience, prescribe a two per cent. preparation, and in the attempt to make a two per cent. article,

the average pharmacist produces a wonderful combination. He said that the mixtures sent out for a two per cent. mercuric oxide ointment are a disgrace to the retail pharmacists of this country. He thought a combination of the U. S. P. and Br. Ph. formulas would serve the best purpose, and that was the process they had used at the German Hospital, in Philadelphia, for some fifteen or sixteen years. They rubbed the mercuric oxide in a small portion of water, and then incorporated it with the petrolatum. The British Pharmacopœia directs a two per cent. oxide in petrolatum, and omits the water; but he himself believed that nothing would break up the small lumps of the mercuric oxide as readily and as rapidly and as well as thorough trituration with small quantities of water.

Mr. Hallberg asked Mr. Wilbert to name any of the leading oculists of Philadelphia who preferred the petrolatum mixture to a mixture of woolfat and petrolatum. Mr. Wilbert replied that he had never gone into this question particularly. He said he had told the physicians about this petrolatum paste, and they had been thoroughly well satisfied with it and had repeatedly come to him and said "Wilbert, I wish we could get the kind of ointment on the outside that we get here."

Continuing, Mr. Hallberg said that he had canvassed the leading ophthalmologists upon the question of these mixtures, and that was the reason that he made this suggestion of woolfat and petrolatum; petrolatum alone, is repelled by the perspiratory pores while woolfat goes down into the follicles and gives the effect so much desired. He said that he had the highest authority for this statement by eminent ophthalmologists.

Mr. Good said he wished to mention an interesting historical fact in regard to the ointment of yellow oxide of mercury: A good many years ago, he said, the oculists of St. Louis used to insist on sending their prescriptions for ointments of yellow oxide of mercury to the store controlled by Charles Habicht & Co. under the Southern Hotel, the successors of Enno Sander. On questioning some of them, and asking why the rest of the pharmacists could not make this ointment, they had replied, because they use the yellow oxide precipitated with lime water. He did not see that that was an essential condition, but somehow or other they seemed to think so, and that was the way it was prepared. He said he thought this showed that while this manner of preparing it was probably correct, it was not a formula that would do for the average druggist; he would probably make a very inferior product.

The Chair called for a paper by H. G. Posey, of New Orleans, on "Compound Solution of Sodium Phosphate." The author was not present, however, and the paper was passed. The full text of this paper here follows:

## "COMPOUND SOLUTION OF SODIUM PHOSPHATE. U. S. P."

BY H. G. POSEY, NEW ORLEANS, LA.

This preparation, as made by the official formula, is so notoriously unstable, and has proven to be so unreliable and disappointing, that the writer some time back decided to investigate the reasons attendant upon its shortcomings. Samples from the stocks of several different stores proved to have all recrystallized more or less, or to have developed a peculiar fungus growth, which made the preparation not only unfit for use, but nauseating to the senses.

The fact that this condition manifested itself only in the U. S. P. product, and not in that of several prominent manufacturing pharmacists, led to the belief that the formula was deficient in something, or was not properly balanced.

A series of U. S. P. solutions, consequently, were prepared, containing various preservative agents, namely: Benzoic acid, boracic acid, and sodium benzoate in proportions varying from 0.1 per cent. to 0.5 per cent., which, while they effectually inhibited the fungoid growth, showed no advantage, for it was found that if the quantity of citric acid were doubled, there would be neither recrystallization nor the usual fungus.

The recommendation of your Committee on Practical Pharmacy and Dispensing, that dried sodium phosphate might solve the difficulty, led the writer to try the dried salt, by using an equivalent quantity (522.50  $\text{Na}_2\text{HPO}_4 + \text{H}_2\text{O}$ ) in place of the 1000 Gm. of ordinary crystallized or granulated di-sodium orthophosphate ( $\text{Na}_2\text{HPO}_4 + 12\text{H}_2\text{O}$ ), and making up the volume with water.

No material difference in the two preparations becomes apparent, and as the dried salt is relatively more expensive, its use can in no way become advantageous.

In view of all the above, it is recommended that the quantity of citric acid be increased to 260 Gm., and that solution of both the salts and the acid be effected by aid of a water bath instead of continued trituration in a mortar, as directed by the Pharmacopœia, and that the resultant product be filtered while yet hot, thereby producing a beautiful, clear liquid, which will compare favorably with the many sodium phosphate solutions now on the market, and will be a credit instead of a discredit to our Pharmacopœia.

The Chair said that the next paper to be considered was one by Mr. Beringer, of New Jersey, on "Fluidglycerates."

Mr. Beringer presented his subject in extended verbal abstract, and in connection with his subject called attention to a large collection of preparations made by him as illustrative of the text of his paper, placed on a table before the Section. Mr. Beringer said that he felt that he should apologize to the Section for the physical condition of many of these samples; that a great many were broken, and on some the labels were soiled and

had to be replaced, and many of them were more or less soiled from carriage on the train.

Mr. Beringer was still engaged in his abstract when the adjourning hour came, and, on motion of Mr. Searby, it was ordered that he should be given an opportunity of continuing and concluding his remarks upon reconvening at 3 p. m.

Thereupon an adjournment was taken to 3 p. m.

---

#### SECOND SESSION—FRIDAY AFTERNOON, SEPTEMBER 11, 1908.

Chairman Apple called the second session of the Section on Practical Pharmacy and Dispensing to order at 3 : 30 p. m.

On motion of Mr. Asher, the reading of the minutes of the first session was dispensed with.

The Chair then invited Mr. Beringer to proceed with the presentation of his paper on "Fluidglycerates," and which was interrupted by the adjourning hour.

Mr. Beringer thereupon continued the verbal abstract of his paper, exhibiting numerous specimens of his products made by the processes described, involving the use of glycerin as an extractive. At the conclusion of his remarks Mr. Beringer was heartily applauded. The full text of his paper here follows :

#### FLUIDGLYCERATES.

BY GEORGE M. BERINGER, CAMDEN, N. J.

In a paper presented to the New Jersey Pharmaceutical Association, at the meeting of last year, the author proposed a new class of liquid galenicals to be known as "Fluidglycerates." \* As proposed these are to be of a uniform drug strength, the same as the official fluidextracts, 1 Cc. of the preparation representing 1 Gm of the drug. The title "fluid-glycerate" was selected as a distinguishing term to designate this class and as being so distinctive that it would prevent confusion with the heterogeneous glyceroles, glycerins and glycerites already introduced and some of which are official under these titles in the various pharmacopœias.

The peculiar solvent and sweetening properties of glycerin were early recognized and numerous attempts have been made to utilize these in pharmaceutical preparations, usually, in combination with alcoholic liquids. Its extensive use in tinctures and fluidextracts has been criticized as an abuse. It is but an indifferent solvent for resins, fats, and fixed oils and, in fact, for most substance requiring alcohol as a perfect solvent and consequently is of but little use as a solvent where such constituents represent

---

\* Proceedings N. J. Phar. Ass'n 1907, 56. Amer. Jr. Pharm., Sept., 1907, 410.

the activity of the drug and its use even with alcohol in such preparations is contraindicated. But in many drugs, these constituents are not valuable and the associated inert extractives are a source of annoyance from the continuous forming of precipitates.

In the writer's experiments with fluidglycerates, the endeavor has been to confine these to preparations of drugs where such alcohol-requiring constituents do not represent the value of the drug, and when present and not essential, to leave these undesirable constituents in the marc. On the other hand, glycerin is a good solvent for many of the sweet, bitter, astringent and essential flavoring constituents of drugs, and possesses a marked solvent action on many of the alkaloids, glucosides and neutral principles.

Preliminary experiments to determine the amount of glycerin necessary to preserve glycerol-water liquid extracts of drugs showed that if glycerin was present in the finished preparation in a proportion of not less than one-third of the volume, the preparations were fairly stable. If only one-fourth or less was present, then decomposition invariably took place sooner or later, but if one-half was used the preparations were permanent, and in the fluidglycerates, as experimented upon and described in this paper, it has been aimed to have approximately fifty per cent. by volume introduced in the products.

In the paper referred to a formula for fluidglycerate of *krameria* was published as a type formula, and of a preparation that clinical experiments had already demonstrated to be a useful form for the exhibition of this drug, especially in catarrhal affections of the rectum. Subsequent extended practical use by a number of physicians has fully confirmed that it is a satisfactory preparation and remedy.

When presenting this paper before the New Jersey Pharmaceutical Association, the writer announced that he was continuing the study of the subject, and intended to extend his experiments to all drugs that appeared as probably suitable for such extraction.

In the more extended work, a number of practical problems presented themselves and had to be overcome. The process of percolation was adopted, wherever practical, in the extraction of the drugs, but it was found that percolation with glycerin-water menstruum was somewhat more difficult than ordinary percolation with hydro-alcoholic liquids. The tendency to pack, "clog" and "block" the percolation is pronounced, and each drug has to be studied to determine the best method of procedure to overcome this trouble. As a rule the drug should be ground very much coarser than ordered by the Pharmacopœia for the making of tinctures and fluidextracts. The penetrating property of glycerin is so marked that usually a number twenty powder is sufficiently fine to yield good results. With fine powders an inert substance must be admixed, and here again a selection is required; for guarana, coarse sharp sand was satisfac-



tory, and for gambir pumice stone, not too fine, was needed. Thorough and even moistening of the drug is essential, and the packing in the percolator must be even, but it must not be firmly or tightly packed; the rapidity of percolation being best controlled by means of a compressor on the exit tube. A few drugs are not amenable to percolation with glycerin-water mixture, senna leaves being a notable example, and for such either of the following methods must be adopted: maceration with the menstruum and expression, or an aqueous infusion prepared and concentrated, to which the glycerin can be added.

Another problem that presented itself was the tendency of the drug in the percolator to undergo fermentation, and even putrefaction, before the final extraction with water was completed. In warm weather this tendency is very evident. It was found that by using chloroform-water instead of distilled water, in forcing out the balance of the first menstruum, and in finishing the extraction, this was effectually overcome. The chloroform is entirely dissipated in the evaporation on the water-bath.

In my original paper I recommended that the first 60 parts of the percolate be set aside as a reserve. Subsequent work demonstrated that this was not always practical, as the remaining portion of the percolate frequently contained so much matter in solution that it was not advisable to concentrate it to 40 parts, and consequently I have adopted 50 parts for reserve. The remainder of the percolate is concentrated to 60 parts the reserve added, and the product concentrated to 100 Cc. for each 100 Gms. of drug used.

The following has been adopted as a general formula or type, and is referred to in this paper as the "type-process" so as to avoid useless repetition. It is stated in terms for 100 Cc. of product, the quantity being that used in each of the numerous experiments tried.

Take of the drug in coarse powder.....	100 Gms.
Glycerin .....	50 Cc.
Distilled water .....	150 Cc.
Chloroform water a sufficient quantity to make of finished product .....	100 Cc.

Mix the glycerin and distilled water and moisten the drug thoroughly with sufficient of the mixture, and then pack it very lightly in a cylindrical percolator and saturate thoroughly with menstruum, cork up and cover the percolator and allow to macerate for two days, then continue to percolate till the drug is exhausted, using first the remainder of the menstruum and then chloroform water. Reserve the first 50 Cc. of percolate and set this aside. Evaporate the remaining percolate on a water-bath, the weaker portion first, then the stronger, till reduced to 60 Cc., and then add the reserve, and continue the evaporation till the product measures 100 Cc. If evaporation has been carried too far, make up to 100 Cc.

with distilled water. Set the product aside several days to settle, decant the clear supernatant layer, and strain the remainder through muslin.

For some of the alkaloidal drugs the addition of an acid to the menstruum to insure extraction was deemed essential, and in these the same acid was not used throughout, but a selection was made that in each case appeared to be the most appropriate to insure extraction with the least amount of decomposition of the alkaloids. In the selection of the acids the writer has quite likely erred in judgment at times. In a few other drugs such as glycyrrhiza and senega the addition of an alkali was deemed necessary, and these additions are all detailed in the formulas.

In the July issue of Merck's Report \* appeared the reprint of an article from the Chemist and Druggist,† which I had not seen before, entitled "Glycetracta or Glycetracts," by W. Harrison Martindale, Ph. D. That gentleman admits that he has "adopted" my suggestion, and refers to the initiatory paper before the New Jersey Pharmaceutical Association "on a method of preparing 'fluidglycerates,' representing the fluidextracts of the U. S. P.; notably, the fluidglycerate of krameria being described." He further states, "I have elaborated and extended the idea to other drugs." His entrance into this promising field of experimentation is welcomed, and his results in many points confirm my own. It is to be regretted, however, that he should ignore the writer's suggestion for the title for this distinct class of preparations, and add further confusion by suggesting another coined modification.

The fluidglycerates as a class possess many advantages that should appeal to physicians and also to the retail druggists. To the former they fill a want for a concentrated infusion, and many of the drugs should be administered in that form. The simple dilution of the fluidglycerate with cold or hot water, as may be desired, will supply a satisfactory substitute for infusion of such drugs as apocynum, chimaphila, eupatorium, pareira, pilocarpus, rhus glabra, scoparius, spigelia, triticum and uva ursi, all of which are preferably administered in that form, and all of which yield good fluidglycerates.

Again, alcohol is frequently therapeutically contraindicated and the alcohol content has been considered detrimental to the action of the tinctures and fluidextracts of such drugs as cimicifuga, cypripedium, valerian, veratrum and viburnum, and it is noticeable that these all likewise yield to glycerin their active constituents. With many patients predisposed to the alcohol habit, the use of alcoholic medicines should be avoided, and here again it is noteworthy that glycerin extracts, the aromatic principles, and the bitter tonics, and that fluidglycerates of such drugs as marrubium, salvia, orange peel, gentian and chirata all appear to be satisfactory preparations, thus enabling the medical practitioner to direct aromatics and bitter tonics

\* Merck's Report, July, 1908, 179.

† Chemist and Druggist, March, 1908, 488.

without the use of alcohol, and this alone should merit medical attention. Their miscibility as a class with syrup and water also aids in the elimination of alcohol.

To the retail druggist they should appeal as a class that he can readily and economically prepare, and not be dependent upon manufacturers, as they can be prepared more easily on a small scale than on a large one. Again, we must look forward to the time, in the near future, when the druggists will be compelled to compound remedies of potent drugs, only with preparations made within recent and specified time. With glycerin replacing alcohol, the fluidglycerates would be an economical means for each pharmacist preparing his own remedies and guaranteeing them and renewing stock frequently.

The writer does not consider that his experiments covering nearly 100 drugs have in all cases been conclusive, and in the detailed formulas the shortcomings of a number of these are pointed out. He frankly admits that numerous experiments are necessary to prove the stability of each one of these fluidglycerates, and also that physiological and chemical tests should be applied to determine the value of many of them. He hopes that some one will thus undertake to prove by clinical experiments and physiological tests the value of such fluidglycerates as digitalis, ergot, gelsemium, lobelia, pomegranate and veratrum. The work so far done on the subject is only preliminary, but it appears to be a very promising field for practical pharmaceutical experimentation.

#### *Fluidglycerate of Aconite.*

Take of Aconite Root, in number 20 powder .....	100 Gm.
Tartaric Acid.....	2 Gm.

Dissolve the tartaric acid in 60 Cc. of the glycerol-water menstruum and moisten the drug with the solution and then proceed to percolate and finish as per type process.

Very little sediment has formed in this preparation. It has remained entirely clear above this and the smallest amount gives the characteristic acid taste and tingling sensation of aconite. It mixes clear with water, syrup or diluted alcohol, but becomes cloudy with alcohol. It assayed by the U. S. P. process of assaying fluidextract of aconite 0.435 Gm. of alkaloid in 100 Cc. The powdered dry marc was nearly free from acidity and the aconite was practically exhausted.

#### *Fluidglycerate of Anthemis.*

Take of Anthemis in number 20 powder .....	100 Gm.
--	---------

Follow the type process, using 120 Cc. of the glycerol-water menstruum to moisten the drug.

The resulting preparation contains the bitterness of the drug and con-

siderable of the aroma. It has formed a semi-gelatinous precipitate distributed throughout the liquid and while miscible with but slight turbidity with water, syrup, diluted alcohol or alcohol I do not consider it entirely satisfactory.

*Fluidglycerate of Apocynum.*

Take of Apocynum in number 20 powder ..... 100 Gm.

Follow the type process using 80 Cc. of the glycerol-water menstruum to moisten the drug.

The resulting preparation has formed only the faintest sediment, is a clear red-brown syrupy liquid, is bitter and has the characteristic taste of the drug. It mixes clear with water, syrup or diluted alcohol and cloudy with alcohol. It appears to fully represent the drug and I believe it to be an excellent form for the exhibition of its action.

*Fluidglycerate of Asclepias.*

Take of Asclepias in number 20 powder ..... 100 Gm.

Proceed according to the type process using 80 Cc. of the glycerol-water menstruum to moisten the drug.

This preparation precipitated slightly before straining, is now clear and appears to be a good preparation of the drug. It mixes clear with water, syrup or diluted alcohol but turbid with alcohol.

*Fluidglycerate of Belladonna Leaves.*

Take of Belladonna leaves in number 40 powder ..... 100 Gm.

Tartaric Acid ..... 2 Gm.

Dissolve the tartaric acid in 80 Cc. of the mixture of glycerin and distilled water and use this solution to moisten the drug and proceed to percolate and finish, following the type process.

On standing the deposit formed at the bottom of the container was about 1/10th of the volume, but after decanting and filtering the preparation remained clear. From physical appearances it appears to represent the drug. It mixes clear with water or diluted alcohol and not quite clear with syrup, with alcohol it produces a cloudiness. It assayed by U. S. P. process for assaying fluidextract of belladonna 0.27542 Gm. alkaloids to 100 Cc.

*Fluidglycerate of Belladonna Root.*

Take of Belladonna root in number 20 powder ..... 100 Gm.

Tartaric Acid ..... 2 Gm.

Dissolve the tartaric acid in 60 Cc. of the mixture of glycerin and dis-

tilled water and moisten the drug with this solution and proceed to percolate and finish, following the type process.

On standing this preparation deposited some starch-like sediment but the decanted and filtered portion has since remained clear. It mixes clear with water, syrup or diluted alcohol and turbid with alcohol. It assayed 0.37884 Gm. alkaloids to 100 Cc.

*Fluidglycerate of Berberis.*

Take of Berberis in number 20 powder..... 100 Gm.

Follow the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

The resulting preparation is clear, greenish-brown in color and mixes clear with water, syrup or diluted alcohol, and only slightly cloudy with alcohol. It appears to be an entirely satisfactory preparation.

*Fluidglycerate of Calumba.*

Take of Calumba in number 20 powder..... 100 Gm.

Follow the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

Only a slight precipitate formed in the preparation, and after straining it was a clear, deep brown, very bitter liquid, and appears to fully represent the drug, and an excellent form for its exhibition. It mixes clear with water, syrup or diluted alcohol, but turbid with alcohol. The dried marc shows that the drug was extracted.

*Fluidglycerate of Cascara Sagrada.*

Take of Cascara Sagrada in number 20 powder..... 100 Gm.

Follow the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

The resulting preparation is bitter, and has not precipitated and no doubt fully represents the activity of the drug. Its miscibility is, however, peculiar, as it mixes clear with alcohol or diluted alcohol, and makes a somewhat cloudy mixture with syrup, and is decidedly turbid with water.

*Bitterless Fluidglycerate of Cascara Sagrada.*

Take of Cascara Sagrada in number 20 powder..... 100 Gm.

Lime..... 5 Gm.

Mix the lime with 200 Cc. of distilled water and stir in the cascara sagrada, moistening the drug evenly and thoroughly. Dry the moist powder by exposure to a moderate heat on a water-bath till air-dry, then proceed with this as directed in the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

The resulting product is deep red-brown in color, bitterless and entirely free from sediment and quite satisfactory. It mixes clear with water, syrup, or diluted alcohol, and cloudy with alcohol.

*Aromatic Fluidglycerate of Cascara Sagrada.*

Take of Bitterless Fluidglycerate of Cascara Sagrada .....	75. Cc.
Fluidglycerate of Glycyrrhiza .....	25. Cc.
Oil of Fennel .....	.1 Cc.
Oil of Cloves .....	.1 Cc.
Oil of Cassia .....	.1 Cc.

Mix.

This is an excellent aromatic preparation in which cascara is effectually disguised.

*Fluidglycerate of Castanea.*

Take of Castanea leaves in number 20 powder .....	100 Gm.
---	---------

Proceed as directed in the type process, using 100 Cc. of the glycerol-water menstruum to moisten the drug and packing very lightly.

The resulting preparation is free from precipitate, a thick, clear, red-brown liquid, having a faint odor of the leaf and slightly acidulous, pleasant bitter and astringent taste. It mixes clear with water, syrup or diluted alcohol, but alcohol coagulates it.

*Fluidglycerate of Caulophyllum.*

Take of Caulophyllum in number 20 powder .....	100 Gm.
--	---------

Proceed according to the type process using 80 Cc. of glycerol-water menstruum to moisten the drug.

The finished product was free of sediment and has remained clear and brilliant with characteristic taste of the drug. With water it mixes with a slight cloudiness and also forms cloudy mixtures with alcohol or diluted alcohol but with syrup it mixes clear. It appears to be a satisfactory preparation.

*Fluidglycerate of Chimaphila.*

Take of Chimaphila in number 20 powder .....	100 Gm.
--	---------

Proceed according to the type process using 60 Cc. of the glycerol-water menstruum to moisten the drug.

The resulting product appears to be an excellent preparation free from sediment and has remained clear and should be an acceptable form for administering the drug. With water it makes a slightly cloudy mixture and with alcohol a turbid one results but it mixes clear with syrup or diluted alcohol.

*Fluidglycerate of Chirata.*

Take of Chirata in number 20 powder..... 100 Gm.

Proceed according to the type process using 80 Cc. of the glycerol-water menstruum to moisten the drug.

The resulting preparation showed a very slight sediment which was readily strained off and the remainder has been clear since. It is a thick dark-brown exceedingly bitter liquid fully representing the drug. It makes with water, syrup or diluted alcohol clear mixtures, but produces with alcohol a cloudiness.

*Fluidglycerate of Cimicifuga.*

Take of Cimicifuga in number 20 powder..... 100 Gm.

Proceed according to the type process moistening the drug with 60 Cc. of the glycerol-water menstruum.

This preparation was one of the surprises of the series. It has remained clear with only the faintest trace of sediment. It is rich in color and taste of the drug, and appears well worthy of medical consideration. It mixes entirely clear with water, syrup or diluted alcohol but with alcohol the mixture is turbid.

*Fluidglycerate of Cinchona.*

Take of Cinchona in number 40 powder..... 100 Gm.

Hydrochloric Acid ..... 5 Cc.

Add the hydrochloric acid to 100 Cc. of the glycerol-water menstruum and in this mixture rub up the cinchona to a paste; set this aside for 24 hours to macerate, then stir up thoroughly and transfer to a conical glass percolator. Then proceed to extract and finish in accordance with the type process.

The product is a thick red liquid, which while slightly cloudy, has deposited practically no sediment. It is acid and very bitter. It mixed clear with alcohol or diluted alcohol and with syrup produced a slight cloudiness, but with water there was formed a precipitate of the bright red coloring matter. Assayed by the official process for assay of fluidextract of cinchona, it showed 3.58 Gm. anhydrous ether-soluble alkaloids in 100 Cc.

*Fluidglycerate of Coca.*

Take of Coca in number 20 powder..... 100 Gm.

Proceed according to the type process using 100 Gm. of glycerol-water menstruum to moisten the drug.

On concentrating the percolate there was produced a decided precipitate, gritty to the feel and taste. This was isolated, washed and tested and

proved to be calcium oxalate. The strained liquid has remained clear and has a decided taste and odor of the coca leaf and this is brought out on dilution. It mixes clear with syrup or diluted alcohol and slightly cloudy with water and is coagulated by strong alcohol. Assayed by the official process for assay of fluidextract of coca, it showed 0.3 Gm. ether-soluble alkaloids in 100 Cc.

#### *Fluidglycerate of Coffee.*

Take of Coffee in number 40 powder..... 100 Gm.

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

Fluidglycerates of both green, or unroasted, and of roasted coffee were prepared and both appear to be satisfactory preparations. That from the roasted coffee will fill a demand that is growing in the trade for a concentrated extract of coffee for making syrup, flavoring for ice cream, soda water, etc.

The following formula is submitted for

#### *Syrup of Coffee.*

Take of Fluidglycerate of Roasted Coffee ..... 100 Cc.

Syrup ..... 70 Cc.

Mix.

The product while only one-half the coffee strength of the N. F. formula for syrup of coffee, will be found quite strong enough for soda water syrup and if a stronger syrup is wanted the proportion of the fluidglycerate can be increased.

#### *Fluidglycerate of Colchicum Corm.*

Take of Colchicum Corm in number 20 powder ..... 100 Gm.

Acetic Acid..... 10 Cc.

Mix the acetic acid with 50 Cc. of the glycerol-water menstruum and moisten the drug with the mixture and then proceed as per the type process.

In this preparation there separated a starch like sediment amounting to about 10 Cc., which was strained out and the liquid has since remained clear. It has a bitter and acidulous taste and mixes clear with syrup and cloudy with alcohol and slightly cloudy with water or diluted alcohol. Assayed by the official process for assay of fluidextract of colchicum seed it gave 0.290 Gm. colchicine in 100 Cc.

#### *Fluidglycerate of Colchicum Seed.*

Take of Colchicum Seed in number 20 powder..... 100 Gm.

Acetic Acid..... 15 Cc.

Mix the acetic acid with 60 Cc. of the menstruum of glycerin and dis-



tilled water and moisten the drug with this; then proceed according to the type process.

The product deposited a scanty sediment, and after straining this off it remained clear and bright. It is red-brown in color, with an acidulous and characteristic bitter taste, and well represents the activity of the drug. It mixes slightly cloudy with water or diluted alcohol, and clear with syrup, but turbid with alcohol. Assayed by the official method for the assay of fluidextract of colchicum seed, it gave 0.36 Gm. of colchicine in 100 Cc.

*Fluidglycerate of Colocynth.*

Take of Colocynth in number 30 powder ..... 100 Gm.

Proceed according to the type process, using 90 Cc. of the glycerol-water menstruum to moisten the drug.

This product deposited a heavy albuminous precipitate, and although the strained liquid has remained clear, the marc shows that the drug has not been exhausted, and I do not consider it satisfactory. The addition of an alkali may be necessary to the glycerol-water menstruum in order to make it a satisfactory medium.

*Fluidglycerates of Conium.*

Take of Conium in number 30 powder ..... 100 Gm.

Acetic Acid ..... 5 Cc.

Mix the acetic acid with 45 Cc. of the glycerol-water menstruum, and moisten the drug with the mixture, and then proceed according to the type process.

An albuminous sediment formed at once on heating. This was allowed to settle in the product, and then gotten rid of by decantation and straining. The preparation has since remained clear, and possesses the odor and taste of the drug. It mixes clear with syrup, slightly cloudy water, more so with diluted alcohol, and quite turbid with alcohol. Assayed by the official process for assay of fluidextract of conium, it yielded 0.466 Gm. of coniine in 100 Cc.

Two other samples were made from the same conium, in the one using 10 Cc. of acetic acid, and the other no acid. The former assayed 0.408 Gm., and the latter 0.120 Gm. of coniine. From these experiments, we are justified in concluding that an acid is essential to the extraction of conium, but that a quantity in excess of that directed is not advisable.

*Fluidglycerate of Cotton Root Bark.*

Take of Cotton Root Bark in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 100 Cc. of the glycerol-water menstruum to moisten the drug.

The product deposited a scant sediment, and appeared to be a satisfactory preparation. It mixes clear with water, syrup, or diluted alcohol; and turbid with alcohol.

*Fluidglycerate of Cypripedium.*

Take of Cypripedium in number 20 powder..... 100 Gm.

Proceed according to the type process using 70 Cc. of the glycerol-water menstruum to moisten the drug.

This product has remained perfectly clear and has the characteristic odor and taste of the drug and the marc shows that the extraction was practically complete. It mixes clear with syrup or diluted alcohol and slightly cloudy with water and still more so with alcohol.

*Fluidglycerate of Digitalis.*

Take of Digitalis in number 40 powder..... 100 Gm.

Proceed according to the type process moistening the drug with 70 Cc. of the glycerol-water menstruum.

The product deposited a slight sediment, but after straining has remained clear and has a marked taste and odor of the drug. It mixes clear with syrup and slightly cloudy with water or diluted alcohol and turbid with alcohol. This product should be submitted to physiological testing.

*Fluidglycerate of Dioscorea.*

Take of Dioscorea in number 20 powder .... 100 Gm.

Proceed according to the type process using 100 Cc. of the glycerol-water menstruum to moisten the drug.

This product deposited a copious starchy sediment which it was impossible to remove entirely by straining and is for that reason not satisfactory. It mixes clear with water, syrup or diluted alcohol and turbid with alcohol.

*Fluidglycerate of Ergot.*

Take of Ergot in number 20 powder..... 100 Gm.

Acetic Acid ..... 2 Cc.

Mix the acetic acid with 40 Cc. of the glycerol-water menstruum and moisten the drug with this mixture, then proceed according to the type process.

The product deposited very little sediment and has remained clear after straining. It is a dark red-brown thick liquid with strong odor and taste of ergot and mixes clear with water, syrup or diluted alcohol but becomes turbid with alcohol. It appears to be a good preparation but should be tested physiologically.

*Fluidglycerate of Eupatorium.*

Take of Eupatorium in number 30 powder ..... 100 Gm.

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

The product deposited scarcely any sediment and remained clear after straining. It appears to be a good preparation, possessing the faint bitter taste and aroma of the drug. It mixes clear with syrup, but slightly cloudy with water and still more so with diluted alcohol and turbid with alcohol.

*Fluidglycerate of Frangula.*

Take of Frangula in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

This is an excellent preparation that has shown no signs of a precipitate, and shows that alcohol is not necessary for the extraction of either of the official barks of Rhamni. Its solubility is peculiar, as it mixes clear with syrup or diluted alcohol, and only slightly cloudy with alcohol, but decidedly cloudy with water.

*Fluidglycerate of Gambir.*

Take of Gambir..... 100 Gm.

Pumice stone in small pieces..... 200 Gm.

Beat the gambir and pumice in a clean mortar till reduced to a uniform number 40 powder; mix this with 100 Cc. of the glycerol-water menstruum and set aside for twenty-four hours, and then rub this up with the addition of sufficient of the menstruum to make a thin sludge and transfer to the percolate. Continue the extraction and preparation in accordance with the type process.

The clayey matter present in gambir makes the percolation of this drug difficult. The product is a thick almost viscous preparation that represents the drug fully. It mixes clear with syrup or diluted alcohol, and produces slight cloudiness with alcohol and an increased turbidity with water.

*Fluidglycerate of Gelsemium.*

Take of Gelsemium in number 20 powder..... 100 Gm.

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

This product remains clear and appears to be a good preparation, and the marc also indicates extraction. It should receive a thorough medical

trial and physiological testing. It mixes clear with water, syrup or diluted alcohol, but alcohol produces a precipitate and turbidity.

*Fluidglycerate of Gentian.*

Take of Gentian in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

On evaporating the weaker aqueous portions of the gentian extract there formed, as the concentration approached completion, a gelatinous thickening. On adding the reserve portion and stirring this was broken up and largely redissolved, and on allowing the product to stand for a few days, with occasional shaking, had almost disappeared. The strained liquid has remained clear and has the bitterness and flavor of the drug. It mixes clear with water, syrup or diluted alcohol, but alcohol produces a decided turbidity.

*Fluidglycerate of Geranium.*

Take of Geranium in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

No sediment has formed in this product and it appears to be an excellent form for the administration of this drug, the valuable astringent principle being well extracted. It mixes clear with syrup or diluted alcohol, cloudy with water and turbid with alcohol.

*Fluidglycerate of Glycyrrhiza.*

Take of Glycyrrhiza in number 20 powder..... 100 Gm.

Ammonia Water..... 5 Cc.

Mix the ammonia water with 60 Cc. of the glycerol-water menstruum and moisten the drug with this mixture and then proceed according to the type process.

The product is rich in the flavor of licorice and the marc shows that the drug has been exhausted. It has remained clear and forms clear mixtures with water, syrup or diluted alcohol but turbid with alcohol.

*Fluidglycerate of Guarana.*

Take of Guarana in number 60 powder..... 100 Gm.

Clean sharp white sand ..... 250 Gm.

Mix the guarana and sand and proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

The product, while not as deep in color as the fluidextract, is bright, clear and rich in the peculiar flavor of the drug. It mixes clear with syrup,

slightly cloudy with water or diluted alcohol and still more cloudy with alcohol. It is one of the good preparations in these experiments and assayed 3.8 Gm. of alkaloid in 100 Cc.

*Fluidglycerate of Hæmatoxylon.*

Take of Hæmatoxylon in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

This is another good product that has shown no signs of sediment and fully represents the astringency of the drug. It makes clear solutions with water, syrup, alcohol or diluted alcohol.

*Fluidglycerate of Hamamelis Bark.*

Take of Hamamelis Bark in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

This is another good preparation that has not deposited any sediment and no doubt fully represents the drug. It mixes clear with water, syrup or diluted alcohol and almost clear with alcohol.

*Fluidglycerate of Hamamelis Leaves.*

Take of Hamamelis Leaves in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

This is likewise a good preparation without any sign of sediment and having a pleasant astringent taste and a faintly aromatic and herbaceous odor. It mixes clear with water, syrup or diluted alcohol, but alcohol produces a coagulation and turbidity.

*Fluidglycerate of Hellebore.*

Take of Hellebore in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

This product had a copious deposit which separated slowly and while it was bitter and tasted of the drug, it was not satisfactory. It made cloudy mixtures with water, syrup, alcohol or diluted alcohol.

*Fluidglycerate of Hops.*

Take of Hops in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 180 Cc. of the glycerol-water menstruum to moisten the drug.

This product at once deposited a small amount of sediment which was

readily strained off, and the liquid has remained clear from sediment but having an opalescence. It possesses in a marked degree the bitterness and aroma of hops. It mixes clear with diluted alcohol and cloudy with water or syrup and turbid with alcohol.

*Fluidglycerate of Hyoscyamus.*

Take of Hyoscyamus in number 40 powder .....	100 Gm.
Tartaric Acid .....	2 Gm.

Dissolve the tartaric acid in 60 Cc. of the glycerol-water menstruum and then proceed according to the type process.

This product deposited considerable sediment but the decanted and strained liquid is clear and has the taste and odor of henbane and this becomes more pronounced on dilution with water. It mixes clear with syrup, cloudy with water or diluted alcohol, and turbid with alcohol. Assayed by the official process for the assay of fluidextract of hyoscyamus, it gave 0.06658 Gm. of alkaloids in 100 Cc.

*Fluidglycerate of Hydrastis.*

Take of Hydrastis in number 30 powder .....	100 Gm.
---	---------

Proceed according to the type process, using 70 Cc. of the glycerol-water menstruum to moisten the drug.

This preparation deposited a sediment soon after made, but the strained liquid has remained clear and has the color, taste and odor of the drug. It mixes clear with syrup, cloudy with water or diluted alcohol and turbid with alcohol, with a copious precipitate. It assayed by the official process for assay of fluidextract of hydrastis 1.86 Gm. hydrastine in 100 Cc.

*Fluidglycerate of Ipecac.*

Take of Ipecac in number 40 powder .....	100 Gm.
Acetic Acid .....	10 Cc.

Mix the acetic acid with 50 Cc. of the glycerol-water menstruum and then proceed according to the type process.

The product is nearly clear, has deposited no sediment and is fully active. It mixes clear with syrup or diluted alcohol and only a slight opalescence with water, but is turbid with alcohol. It assayed by the official process for assay of fluidextract of ipecac 1.4756 Gm. alkaloids in 100 Cc.

*Fluidglycerate of Krameria.*

Take of Krameria in number 20 powder .....	100 Gm.
--	---------

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

This has proved to be an entirely satisfactory preparation, and a sample two years old shows no deterioration. It mixes clear with syrup, diluted alcohol or alcohol, but makes with water a slightly cloudy mixture, having a purplish-tinted opalescence.

*Fluidglycerate of Lappa.*

Take of Lappa in number 20 powder..... 100 Gm.

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

This product deposited a copious starchy semi-gelatinous sediment, and although it had the odor and taste of the drug I do not consider it satisfactory. It mixed clear with water, syrup or diluted alcohol, but turbid with alcohol.

*Fluidglycerate of Lobelia.*

Take of Lobelia in number 30 powder..... 100 Gm.

Acetic Acid ..... 25 Cc.

Mix the acetic acid with 75 Cc. of the glycerol-water menstruum, and moisten the drug with this mixture, and then proceed according to the type process.

This is a good product, showing but a trace of precipitate, and possessing all the acidity and irritating taste of the drug. It mixes clear with water, syrup or diluted alcohol.

*Fluidglycerate of Marrubium.*

Take of Marrubium in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 100 Cc. of the glycerol-water menstruum for moistening the drug.

This product has deposited but a very scant sediment. It has the odor and taste of horehound, and should prove useful. It mixes clear with water or syrup, and nearly clear with diluted alcohol, but alcohol produces a copious precipitate and turbidity.

*Fluidglycerate of Matricaria.*

Take of Matricaria in number 20 powder..... 100 Gm.

Proceed according to the type process, using 100 Cc. of the glycerol-water menstruum to moisten the drug.

The product deposited a copious gelatinous precipitate, and was not considered as satisfactory, although possessing the bitterness and aroma of the drug. It mixes clear with syrup or diluted alcohol, slightly cloudy with water, and turbid with alcohol.

*Fluidglycerate of Nutgall.*

Take of Nutgall in number 20 powder ..... 100 Gm.

Rub up the nutgall in a clean mortar with 120 Cc. of the glycerol-water menstruum and then transfer it to the percolator and proceed according to the type process.

It is very difficult to percolate powdered nutgall in the usual way. If the powder is too fine it will at once gum and resist all attempts at extraction with the menstruum, and so it was found necessary to use a coarsely ground drug and to make this into a very thin paste before attempting extraction. The product separated what at first seemed like considerable sediment, but this deposited as a small amount of precipitate closely adhering to the bottom of the bottle, and from which the clear liquid was readily decanted. It mixes clear with water, syrup, or diluted alcohol and almost clear with alcohol.

*Fluidglycerate of Nux Vomica.*

Take of Nux Vomica in number 20 powder..... 100 Gm.  
Acetic Acid..... 5 Cc.

Mix the acetic acid with 80 Cc. of the glycerol-water menstruum and moisten the drug with this mixture and then proceed according to the type process.

This product is peculiar from the fact that while it has not precipitated, it became thick and opalescent and the thickening has increased to a mucilaginous consistence. It mixes clear with syrup, cloudy with water or diluted alcohol and turbid with alcohol. It assayed 0.996 Gm. strychnine in 100 Cc. This preparation will require further experiment and possibly a change in the acid constituent will make it entirely satisfactory.

*Fluidglycerate of Bitter Orange Peel.*

Take of Bitter Orange Peel in number 20 powder..... 100 Gm.

Proceed according to the type process, using 100 Cc. of the glycerol-water menstruum to moisten the drug.

The product formed a mucilaginous sediment but after straining it has remained clear. It has the bitterness and considerable of the flavor of orange peel, the aroma being brought out on dilution. It mixes clear with water, syrup or diluted alcohol and cloudy with alcohol.

*Fluidglycerate of Sweet Orange Peel.*

Take of Sweet Orange Peel in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 100 Cc. of the glycerol-water menstruum to moisten the drug.



The product formed much less precipitate than the bitter orange, was readily decanted and after straining has remained clear. It is slightly acid, pleasantly bitter and has a good aroma. It mixes clear with water, syrup or diluted alcohol and slightly cloudy with alcohol.

*Fluidglycerate of Pareira.*

Take of Pareira in number 20 powder..... 100 Gm.

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

This product deposited a starch-like sediment which was readily removed by straining. It has since continued clear, and is decidedly bitter and makes slightly cloudy mixtures with water, syrup or diluted alcohol and turbid with alcohol.

*Fluidglycerate of Phytolacca Root.*

Take of Phytolacca Root in number 20 powder..... 100 Gm.

Proceed according to the type process, using 100 Cc. of the glycerol-water menstruum to moisten the drug.

The product was a clear, red-brown liquid which on standing has become thick, almost gelatinous, and for this reason I do not consider the preparation satisfactory. Probably poke root yields too much to solution to permit of a preparation of this strength.

*Fluidglycerate of Pilocarpus.*

Take of Pilocarpus in number 20 powder..... 100 Gm.

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

The precipitate formed in this product was not appreciable. It is rich in odor and taste of the leaf and this should be an ideal form of administering the drug. It mixes clear with water, syrup or diluted alcohol, and turbid with alcohol. Assayed by the official process for assaying the fluid-extract of pilocarpus it yielded 0.35 Gm. of alkaloids in 100 Cc.

*Fluidglycerate of Pomegranate.*

Take of Pomegranate in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 70 Cc. of the glycerol-water menstruum to moisten the drug.

The product is a perfectly clear, astringent and bitter liquid, which doubtless represents the drug, and should prove a valuable remedy. It mixes clear with syrup or diluted alcohol, and turbid with water or alcohol.

*Fluidglycerate of Quassia.*

Take of Quassia in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 90 Cc. of the glycerol-water menstruum to moisten the drug.

This product is an excellent preparation of the drug that has deposited no appreciable sediment and the marc shows that the drug was exhausted as far as possible. It mixes clear with water, syrup or diluted alcohol, and opalescent with alcohol.

*Fluidglycerate of Quillaja.*

Take of Quillaja in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 100 Cc. of the glycerol-water menstruum to moisten the drug.

This is another good preparation, being clear and active. It mixes clear with water, syrup or diluted alcohol, and cloudy with alcohol.

*Fluidglycerate of Red Clover.*

Take of Red Clover in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 100 Cc. of the glycerol-water menstruum to moisten the drug.

The product separated at first a mucilaginous sediment that occupied nearly one third of the bottle. After some time this deposited and the strained liquid has remained clear. It is pleasant, acidulous and astringent, and mixes clear with water, syrup or diluted alcohol, and turbid with alcohol.

*Fluidglycerate of Red Rose.*

Take of Red Rose in number 60 powder ..... 100 Gm.

Mix the powdered rose petals with at least an equal bulk of clean sand and proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

This product is not entirely satisfactory, being exceedingly astringent but deficient in color. The addition of acid would possibly improve the formula. It mixes clear with syrup or diluted alcohol, but cloudy with water or alcohol.

*Fluidglycerate of Rhubarb.*

Take of Rhubarb in number 30 powder ..... 100 Gm.

Proceed according to the type process, using 50 Cc. of the glycerol-water menstruum to moisten the drug.

This product is thick, clear, rich in odor and taste of the drug and is

an excellent preparation and the marc shows that the drug was fully exhausted. It mixes clear with syrup or diluted alcohol, but cloudy with water, and alcohol makes a turbid mixture with decided precipitate.

*Fluidglycerate of Rhus Glabra.*

Take of Rhus Glabra in number 20 powder..... 100 Gm.

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

This is a handsome preparation, being a clear red liquid possessing the acid astringent taste of the drug and fully representing it and should be a very proper form for the exhibition of this remedy. It mixes clear with water, syrup or diluted alcohol and slightly cloudy with alcohol.

*Fluidglycerate of Rubus.*

Take Rubus in number 20 powder..... 100 Gm.

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

The product deposited a gray-colored sediment closely adhering to the bottom of the bottle and from this it was readily strained, and it is now a somewhat opalescent, very astringent liquid that mixes clear with syrup or diluted alcohol, cloudy with water and turbid with alcohol.

*Fluidglycerate of Rumex.*

Take of Rumex in number 20 powder..... 100 Gm.

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

This is another good product that has but a trace of sediment. It mixes clear with syrup or diluted alcohol and cloudy with water and turbid with alcohol.

*Fluidglycerate of Salvia.*

Take of Salvia in number 30 powder..... 100 Gm.

Proceed according to the type process, using 100 Cc. of the glycerol-water menstruum to moisten the drug.

This product has deposited but a trace of sediment, is clear and possesses the well-marked odor and taste of the drug which it appears to well represent. It mixes clear with water, syrup or diluted alcohol and turbid with alcohol.

*Fluidglycerate of Sanguinaria.*

Take of Sanguinaria in number 20 powder..... 100 Gm.

Acetic Acid ..... 25 Gm.

Mix the acetic acid with 40 Cc. of the glycerol-water menstruum and

moisten the drug with the mixture and then proceed according to the type process.

This product has not proven to be entirely satisfactory, as it has developed considerable sediment. It mixes cloudy with water or syrup, nearly clear with diluted alcohol but turbid with alcohol. It is intended to continue the experiments with sanguinaria as it is believed that a satisfactory fluidglycerate can be made.

*Fluidglycerate of Sarsaparilla.*

Take of Sarsaparilla in number 20 powder..... 100 Gm.

Proceed according to the type process, using 65 Cc. of the glycerol-water menstruum to moisten the drug.

This product is an ideal preparation, clear, bright and represents the drug fully. It mixes clear with water, syrup or diluted alcohol but is turbid with alcohol.

*Fluidglycerate of Scoparius.*

Take of Scoparius in number 20 powder..... 100 Gm.

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

This is another satisfactory preparation that has deposited no sediment. It mixes clear with syrup or diluted alcohol, but cloudy with water and turbid with alcohol.

*Fluidglycerate of Scutellaria.*

Take of Scutellaria in number 20 powder..... 100 Gm.

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

The product formed but a small amount of compact sediment from which it was readily strained and has since remained clear and well represents the drug. It mixes clear with syrup or diluted alcohol and cloudy with water and is coagulated by alcohol.

*Fluidglycerate of Senega.*

Take of Senega in number 20 powder..... 100 Gm.

Solution of Potassium Hydroxide..... 5 Cc.

Mix the solution of potassium hydroxide with 50 Cc. of the glycerol-water menstruum and moisten the drug with this mixture and then proceed according to the type process.

The product is opalescent and quite thick, but has been free from sediment. It mixes clear with syrup, opalescent with water, cloudy with diluted alcohol and turbid with alcohol.

*Fluidglycerate of Senna.*

Take of Senna in number 20 powder .....	100 Gm.
Glycerin .....	50 Cc.
Distilled water a sufficient quantity.	

Infuse the senna in 250 Cc. of warm water and when cold strain with pressure, repeat the infusion twice with the same amount of warm distilled water, mix the strained liquids and evaporate on the water-bath to 50 Cc., add the glycerin and strain.

It was found to be impossible to percolate senna with the glycerol-water menstruum, as it assumed a gummy mass which absolutely blocked the percolator. Consequently an infusion process was here adopted. The product is very thick and dark and mixes clear with syrup, cloudy with water or diluted alcohol, and is coagulated by alcohol.

*Fluidglycerate of Spigelia.*

Take of Spigelia in number 20 powder .....	100 Gm.
--	---------

Proceed according to the type process, using 85 Cc. of the glycerol-water menstruum to moisten the drug.

This is an excellent preparation, has not precipitated, and has all aroma and peculiar pungent and acrid taste of the drug. It mixes clear with syrup, slightly cloudy with water or diluted alcohol, and turbid with alcohol.

*Fluidglycerate of Squill.*

Take of Squill in number 20 powder .....	100 Gm.
--	---------

Place the squill in a suitable percolator, merely shaking it down and not packing, and then proceed to percolate with the menstruum as directed in the type process.

On evaporating the percolate there formed a flocculent coagulated albuminous precipitate. This was strained off and the finished product filtered through absorbent cotton, and this has since remained clear. It is quite bitter and acrid, and the marc indicates extraction. It mixes clear with water, syrup or diluted alcohol, but alcohol in excess produces a milky turbidity.

*Fluidglycerate of Stillingia.*

Take of Stillingia in number 20 powder .....	100 Gm.
--	---------

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

This is a good preparation of the drug, possessing its odor and taste strongly and free from sediment. It mixes clear with water, syrup or diluted alcohol, and turbid with alcohol.

*Fluidglycerate of Stramonium.*

Take of Stramonium in number 30 powder .....	100 Gm.
Tartaric Acid .....	2 Gm.

Dissolve the tartaric acid in 60 Cc. of the glycerol-water menstruum and moisten the drug with this mixture and then proceed according to the type process.

The product was not entirely satisfactory, as there formed in it a copious gelatinous precipitate which was strained off. The preparation mixes clear with syrup, cloudy with water or diluted alcohol, and turbid with alcohol. Assayed by the official process for assaying fluidextract of stramonium, it yielded 0.2296 Gm. alkaloids in 100 Cc.

*Fluidglycerate of Sumbul.*

Take of Sumbul in number 20 powder .....	100 Gm.
--	---------

Proceed according to the type process, using 100 Cc. of the glycerol-water menstruum to moisten the drug.

The product was surprisingly strong in the odor and taste of the drug, and has deposited only a slight gelatinous sediment. It mixes clear with syrup, opalescent with water, cloudy with diluted alcohol, and turbid with alcohol.

*Fluidglycerate of Taraxacum.*

Take of Taraxacum in number 20 powder.....	100 Gm.
--	---------

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

In this product there has formed a small amount of gelatinous sediment removed by decantation. It mixes clear with water, syrup or diluted alcohol, and turbid with alcohol.

*Fluidglycerate of Tea.*

Take of Tea in number 30 powder.....	100 Gm.
--------------------------------------	---------

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

The product is clear and satisfactory, and has the odor and taste of the leaf well preserved. It mixes clear with syrup, opalescent with water or diluted alcohol, and turbid with alcohol.

*Fluidglycerate of Triticum.*

Take of Triticum in number 20 powder.....	100 Gm.
---	---------

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

The product has deposited scarcely any sediment, has a pleasant malt-like taste, and mixes clear with water, syrup or diluted alcohol, and turbid with alcohol.

*Fluidglycerate of Uva Ursi.*

Take of Uva Ursi in number 20 powder..... 100 Gm.

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

The product is fine, being heavy and clear. It mixes clear with syrup or diluted alcohol, opalescent with water, and is coagulated by alcohol.

*Fluidglycerate of Valerian.*

Take of Valerian in number 20 powder..... 100 Gm.

Proceed according to the type process, using 60 Cc. of the glycerol-water menstruum to moisten the drug.

This product was one of the surprises. It has deposited but a very scant sediment, and is now clear, and has a strong odor and taste of the drug, and the marc appears to be extracted. It mixes clear with water, syrup or diluted alcohol, and turbid with alcohol.

*Fluidglycerate of Veratrum Viride.*

Take of Veratrum Viride in number 20 powder..... 100 Gm.

Tartaric Acid..... 2 Gm.

Dissolve the tartaric acid in 80 Cc. of the glycerol-water menstruum, and moisten the drug with this mixture, and then proceed according to the type process.

A slight sediment formed in the product, but soon settled and the preparation is now clear. It has the taste and slight tingling sensation and acidity of the drug, and is well worth medical trial. It mixes clear with water, syrup or diluted alcohol, and turbid with alcohol.

*Fluidglycerate of Viburnum Opulus.*

Take of Viburnum Opulus in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 100 Cc. of the glycerol-water menstruum to moisten the drug.

The product deposited scarcely any sediment and appears to be another good preparation. It mixes clear with syrup or diluted alcohol, slightly cloudy with water and cloudy with alcohol.

*Fluidglycerate of Viburnum Prunifolium.*

Take of Viburnum Prunifolium in number 20 powder ..... 100 Gm.

Proceed according to the type process, using 80 Cc. of the glycerol-water menstruum to moisten the drug.

This product has remained clear, is of a deep rich color with a strong valerian-like odor and taste and should be a valuable preparation. It mixes clear with syrup or diluted alcohol, and cloudy with water and still more so with alcohol.

*Fluidglycerate of White Oak.*

Take of White Oak in number 20 powder..... 100 Gm.

Proceed according to the type process, using 70 Cc. of the glycerol-water menstruum to moisten the drug.

The product is rich in tannin, deep in color and strong in taste of the drug and has remained clear. It mixes clear with water, syrup or diluted alcohol and only slightly cloudy with alcohol.

*Fluidglycerate of Wild Cherry.*

Take of Wild Cherry in number 20 powder..... 100 Gm.

Proceed according to the type process, using 70 Cc. of the glycerol-water menstruum to moisten the drug.

The product deposited a small amount of gelatinous sediment, but after straining has remained clear. It has the characteristic bitter and astringent taste and odor of the drug in a concentrated form. It mixes clear with syrup or diluted alcohol, slightly cloudy with water and alcohol.

Mr. Scoville said he was sure the Section would be very glad to pass a vote of thanks to Mr. Beringer for this very interesting paper, involving so much time and detail to accomplish, and he so moved. This motion was seconded by Mr. Hynson and Mr. Hallberg.

Continuing, Mr. Scoville said this was a new line of work, and he did not propose to discuss the paper, but simply to briefly mention one or two points: he had at one time thought that glycerin would make an ideal menstruum for astringent drugs, and had prepared a fluidextract of nutgall with a menstruum of 60 per cent. glycerin and water, and another with the official menstruum. These had been kept under observation, and examined from time to time, both physically and chemically.

Mr. Scoville said he found the glycerin product had precipitated very much more quickly and in larger amounts than the alcoholic, and he had also found that the glycerin product had almost entirely lost its tannic acid, but showed abundance of gallic acid. The tannin seemed to be changed entirely to gallic acid with some loss. He did not try it on any other astringent drug, but it seemed to indicate that with that type of drug the gallo-tannins were hydrolized rapidly in non-alcoholic menstrua and this was not as good a preservative as the alcohol. He found a slight change in the alcoholic product but not nearly as much as in the others. He did not believe it was possible to keep a tannin preparation, especially



of the gallo-tannin class in the original form very long. His limited experience would indicate that alcohol was better for that class of drugs.

The Chair then put the vote on Mr. Scoville's motion to extend a special vote of thanks to Mr. Beringer for his most interesting, exhaustive and edifying paper, and it was carried unanimously.

Mr. Searby then moved that the paper of Mr. Beringer be received and referred to the general Revision Committee of the United States Pharmacopœia. He said he thought it was of sufficient value to be specially referred to that committee for consideration. There were many things, he said, that Mr. Beringer had brought out, and which he apparently verified by his assays and the general character of the exhibits he had submitted, and, in his judgment, this process was certainly deserving of very serious consideration, and probably of adoption of some of these preparations.

Mr. Hynson seconded Mr. Searby's motion.

Mr. Good also seconded the motion made by Mr. Searby, and said he had been very much gratified in listening to Mr. Beringer's explanations. This paper was particularly gratifying to him, he said, because he had had in mind for a long time just such work as this, and he had often wished that some man with the requisite skill and time and energy to give to it would take it up. His mind was set in that direction some years ago, from the fact that there was a certain line of fluidextracts on the market that were very popular. They made a good appearance, they were heavy, and, altogether, a person making a superficial examination of them, would think that the ordinary extracts could not compare with them in any way. Pretty soon, however, their competitors called attention to the fact that the manufacturers were not making U. S. P. extracts at all, but were using a great deal of glycerin in their menstruum, and that gave body to the extract and made a different product. But it set him to thinking about this matter, and he concluded that these people ought not to be condemned too severely, after all. "This thing is just what we have wanted," he said, referring to Mr. Beringer's paper.

Mr. Burge, of Nashville, asked if the reference to the committee proposed would not interfere with the publication of the paper in the Proceedings of the Association. The Chair answered in the negative.

Mr. Hallberg, as a preliminary to the discussion of the paper, also seconded the motion to refer to the Committee of Revision of the U. S. P. He said here was something for the benefit of the retail pharmacists in fact. He did not hear Mr. Beringer make any general assertion as to the cost of these preparations as compared with the alcoholic extracts, but it would be readily recognized as the difference between alcohol and fifty per cent. glycerin. It showed there would be a very material reduction in the price. With glycerin at such a low rate, relatively, any pharmacist could imagine what this method would cost as compared with the alcoholic method. It would put in the hands of retail pharmacists the

making of preparations where the ordinary fluidextracts in many cases were prohibitive, because of the price of alcohol, that is, making them in a small way.

Then, again, this method had certain pharmaceutical advantages that were not to be had from the alcoholic preparations. Mr. Hallberg said that, like Mr. Good, he had, some ten years ago, made some of these preparations. The only one he could remember was krameria, and he had found that very satisfactory. He had a preparation 200 per cent. in strength, twice the strength of this preparation. He had this extract of krameria in this thick glycerin solution, and it was very convenient, indeed, and very satisfactory; and as an illustration of that, a small portion of it that he had had for ten years was apparently now as good as when made.

Continuing, Mr. Hallberg said he thought it was quite likely that some of these processes would have to be modified.

As to nutgall, he said that was one of the most difficult of fluidextracts in the whole category to make. He recalled once having had ten pounds of nutgall in a glass percolator for three months, without action on it; and he thought that if this process would make a good fluidextract of nutgall that was "proof of the pudding," because it was certainly one of the most complex and difficult drugs in the whole list to deal with. He said he always felt when he could get his students to make a fluidextract that would not precipitate, that something of real worth had been accomplished by them.

Mr. Hallberg concluded his remarks by saying that this was the most valuable work that had ever been brought before the American Pharmaceutical Association for the benefit of the retail pharmacists of this country; that that was his deliberate opinion.

In reply to Professor Scoville Mr. Beringer said that fluidglycerate of nutgall formed a peculiar precipitate which had first appeared to extend almost half way up from the bottom of the bottle, afterwards it settled into a compact sediment adhering closely to the bottom. Even if the tannin is transformed entirely into gallic acid that would be no objection, in his opinion, because nutgall is often used in cases of hemoptysis and other forms of hemorrhage where gallic acid is the valuable remedy sought, and for such uses the fluidglycerate of nutgall would probably prove a valuable remedy. If the physician does not know this, it would be a good idea to have it brought to his attention. He said he did not claim that this work was, in any way, near completion, but it was only a preliminary step and he expressed the hope that other pharmacists would continue experiments along this line. His krameria preparation he had made over two years and it had kept well. He believed that fluidglycerate of nux vomica with the addition of hydrochloric acid in place of the acetic would be entirely satisfactory. The retail pharmacist could make these fluidglycerates in quantities such as he may need and this he believed would be a step in the right direction.

Our fluidextracts have gone through a period of experimentation extending for more than fifty years and some are still unsatisfactory.

Mr. Asher said he felt like Mr. Hallberg, that this had been about as interesting an exhibit as the Association had had before it, and what appealed to him greatly was the large amount of painstaking work that had been bestowed upon it by Mr. Beringer. These experiments are usually conducted for a week or two, or at most, for a few weeks; but this line of experiments had been carried on for over two years.

Mr. Hallberg suggested this point as in favor of the process used by Mr. Beringer, as of paramount importance to the retail pharmacist. He said the excuse by pharmacists for not making these galenical preparations before was, that they did not have the apparatus, or have a still for recovering the alcohol. In making the fluidextracts it was not only necessary to have the ordinary percolator, but also to have stills, water-baths, etc. In this case the pharmacist may make these fluidglycerates without the use of a still. The loss of alcohol in making fluidextracts on a small scale is so great that the average retail pharmacist can hardly stand it, whereas the manufacturer is provided with apparatus to recover it. But this objection does not occur in this case. In the fluidextracts of the Pharmacopœia, only a few of them contain glycerin.

Mr. Hallberg asked Mr. Beringer if he had experienced any difficulty in the assay of the fluidglycerates. In reply, Mr. Beringer said that he found them somewhat more difficult to assay than the official fluidextracts, as the glycerin increased the tendency to form emulsions, especially with those processes where chloroform was used as the alkaloidal solvent. As the comparison was being made between fluidglycerates and fluidextracts, he had deemed it advisable to follow the processes used by the Pharmacopœia, and to overcome this difficulty of emulsifying, as far as possible, he had used more of the solvent. Another point to which he directed attention was that the tendency to form emulsions was increased by the use of an excess of alkali, and he was careful to avoid a notable excess of ammonia in the precipitation. By carefully following these two points the principal difficulty in the assaying of the fluidglycerates was overcome.

The Chair said the point had been reached when this subject should be deferred to the Scientific Section. The practical pharmacist had done his part, and now it was up to the Scientific Section to take hold of it and carry it out and see whether the assay processes could be successfully applied.

Mr. Hynson said that while this was an important and desirable class of preparations, because these fluidglycerates could be made by the retail pharmacists much cheaper than the official fluidextracts, and because there are other advantages over the ordinary fluidextracts—which had come to be very little used in dispensing, and had become almost a thing of the past—the important thing was as to whether it should be introduced as a

new line of preparations, or introduced to take the place of the fluid-extracts made by the use of alcohol.

Mr. Beringer replied that he had not so found it as to the fluidextracts, that some of them were very much on the increase as to use. He would not like to say, though, that these fluidglycerates should displace the fluid-extracts. His idea was that they should be introduced as a new class or line of preparations.

Mr. Good wanted to know about hydrastis. Mr. Beringer said, that, in his experience, there was no demand for the so-called glycerite of the Pharmacopœia, though he had had a few calls for the so-called aqueous extract. Mr. Good suggested that in the process under discussion the resinous matter did not appear to be brought out. Mr. Beringer responded that his menstruum did not extract the resinous matter, but did extract the hydrastine.

The Chair here put the vote on the motion to refer Mr. Beringer's paper to the Revision Committee of the United States Pharmacopœia, and it was adopted.

The Chair said the next order of business was the election of officers. Mr. LaWall asked the Secretary to read the list of nominees. The Secretary stated that the nominee for Chairman was Mr. L. A. Seltzer, of Detroit; for Secretary, Mr. A. Fullerton Cook, of Philadelphia, and for Associate on the Committee, Mr. Otto Raubenheimer, of Brooklyn. The Chair called for further nominations for these offices, but none was offered, and the Chair declared nominations closed. Mr. Good, seconded by Mr. Kennedy, thereupon moved that the Secretary cast the affirmative ballot of the Section for the gentlemen named as officers of the Section for the ensuing year. This motion was adopted, and the Secretary announced that he had cast the ballot of the Section, as directed, for Mr. Seltzer for Chairman, Mr. Cook for Secretary, and Mr. Raubenheimer for Associate and the Chair declared these gentlemen duly elected.

Mr. Hynson, at request of the Chair, presented in abstract a paper by Mr. Raubenheimer on "Bismuthi Hydroxidum," the full text thereof being as follows:

#### BISMUTHI HYDROXIDUM.

BY OTTO RAUBENHEIMER, PH. G., BROOKLYN, N. Y.

Under the title, *Bismuthi Oxidum Hydratum*, or Hydrated Oxide of Bismuth, this preparation is contained in the first, second and third editions of our National Formulary. Neither the New York and Brooklyn Formulary, nor the preliminary draft\* for the N. F., I, contains this chemical. Inasmuch as the official title, *Ferri Oxidum Hydratum* and others in U. S. P., 1890, has been changed in U. S. P. VIII to *Ferri Hydroxidum*,

\* Proc. A. Ph. A., Vol. 34.

etc., then why not use the new nomenclature, and also change the N. F. name *Bismuthi Oxidum Hydratum* to *Bismuthi Hydroxidum*.

I admit, it is true, the authorities differ on the exact chemical composition of this preparation. Some authors assert it to be the triacid base,

$\text{Bi}(\text{OH})_3$ , graphic structural formula  $\text{Bi} \begin{array}{c} \text{OH} \\ \diagup \quad \diagdown \\ \text{OH} \quad \text{OH} \end{array}$ , bismuth orthohydroxide

(Dammer), or trihydroxide (Roscoe and Schorlemmer) or bismuthous hydroxide (Ramsey), or idrato bismutico (Orosi). Others claim it is the

monoacid base,  $\text{BiO}(\text{OH})$ , graphic structural formula  $\text{Bi} \begin{array}{c} \text{OH} \\ \diagup \\ \text{O} \end{array}$ , bismuth

metahydroxide (Mendelejeff, Dammer, Brestowski), monohydroxide (Roscoe and Schorlemmer), bismuthyl hydroxide (Dammer), wismut or wismutan hydroxid (Schmidt), or hydrate bismutheux (Wurtz). Watt's Dictionary, 1899, Vol. 1, p. 514, gives it as hydrated bismuthous oxide  $\text{Bi}_2\text{O}_3 \cdot x \text{H}_2\text{O}$ ;  $x$  can be 1, 2 or 3.

Peter MacEwan, the editor of the Chemist and Druggist, in his excellent book, "Pharmaceutical Formulas," 1899, p. 464, states (rather old-fashioned), "There is always some loss of bismuth, but not much, in preparing by precipitation with ammonia, ammonia salts being excellent solvents of bismuth compounds (in my opinion, however,  $\text{Bi}(\text{OH})_3$  is insoluble in excess of  $\text{NH}_4\text{OH}$  or  $\text{NH}_4\text{NO}_3$ ). The degree of hydration in making hydrated oxide of bismuth is a bit erratic, but the compound formed does appear to be  $\text{Bi}(\text{OH})_3$ , i. e., a hydroxide. Experience, however, has demonstrated that the compound prepared according to the N. F. formula is constantly  $\text{Bi}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$ , and if no heat is used in drying it remains so."

I have spent several days in the library of the Chemists' Club, New York City, and have looked up the most important American, English, German, French and Italian literature regarding bismuth hydroxide. One recent French work\* even speaks of  $\text{Bi}(\text{OH})_3$ , which evidently is a typographical error for  $\text{Bi}(\text{OH})_3$ .

As a pharmacist, it seems rather strange to me, that all these chemical works (too numerous to mention) in the preparation of  $\text{Bi}(\text{OH})_3$ , order the ammonia or other alkali to be added to the bismuth solution. Even the Codex Medicamentarius (French Pharmacopœia), in which "Oxyde de bismuth hydraté" is official and also the recent British Pharmaceutical Codex under the title *Bismuthi Hydroxidum* order this very same *wrong modus operandi*.

Our N. F., however, rightly directs to pour the bismuth solution into the ammonia water. There is no doubt that then the freshly prepared moist precipitate is a true bismuth hydroxide,  $\text{Bi}(\text{OH})_3$ , provided the ammonia water is in excess. This last point, namely, that the solution remains distinctly alkaline, is very important indeed, otherwise the precipitate will

\* Henri Moissan, Traité de Chimie Minérale, Paris, 1905, Vol. II, p. 78.

consist of a mixture of hydroxide and basic nitrate. Dr. Max Biechele in his excellent new book: *Reaktionen der für die Pharmazie Wichtigsten Verbindungen* \* even gives the following reaction:

$\text{Bi}(\text{NO}_3)_3 + 2\text{NH}_3 + 2\text{H}_2\text{O} = \text{Bi}(\text{OH})_3 + 2\text{NH}_4\text{NO}_3$ . In corresponding with Dr. Biechele on this point he referred me to Professor Autenrieth's *Qualitative Analysis* who holds the same view. This precipitate by thorough washing will, however, be changed to bismuth hydroxide:

#### AN ERROR IN THE N. F. FORMULA.

When I started my experiments with bismuth hydroxide and also cream of bismuth just about a year ago, I strictly followed the N. F. formula. The directions for operating are very plain. The bismuth subnitrate is mixed with a little water and then the nitric acid is added and the whole agitated in order to effect solution, that is, an acid solution of bismuth nitrate. Right here I desire to caution you never to add the nitric acid directly to the subnitrate, as in that case a hard mass is formed in the bottom of the flask, which mass is very difficult to dissolve. The next step is to filter this solution of bismuth trinitrate into water that has been previously acidulated with nitric acid, so that no bismuth subnitrate will be thrown down. The object of this step is to prepare a dilute acid solution of bismuth nitrate, which is poured *slowly and with constant stirring* into a very little dilute ammonia solution. Now the N. F. directs to pour this dilute acid solution of bismuth nitrate *slowly and with constant stirring* into the very dilute ammonia water. Through numerous experiments on this very point, I am prepared to state that in order to obtain a very light and bulky precipitate of  $\text{Bi}(\text{OH})_3$ , the bismuth solution must be poured *all at once* into the ammonia solution, just the reverse of the N. F. directions. The intention of the N. F. undoubtedly is to have the ammonia in excess, but, instead of being in excess, the amount of ammonia water is greatly deficient.

How I discovered this may be told. I was somewhat surprised that I did not obtain a bulkier precipitate. I then tested the supernatant liquid and to my surprise found it to be very acid. My first thought was that the ammonia water must be below standard, but when I determined the percentage of ammonia gas I found it be 10 per cent., that is U. S. P. strength. I cautiously added ammonia water to the supernatant liquid, and found in order to precipitate all the bismuth and have ammonia in excess, that it took 1400 Gm. of Aqua Ammoniae U. S. P., (10 per cent.  $\text{NH}_3$ ) instead of 600 Gm., as directed by the N. F.

How such a gross mistake should be perpetrated in our National Formulary, and remain in three editions during twenty years, from 1888 to 1908, I do not understand! This does not speak well for the Committee of

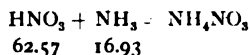
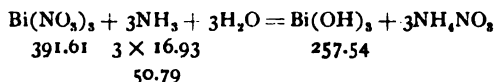
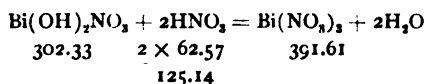
\* Ferd. Enke, Stuttgart, 1908, p. 43.

Revision, or the retail pharmacist, or the chemical manufacturer. The retail pharmacist in this case can be excused, because, as a rule, he does not prepare this chemical himself, but should not one of the many manufacturing chemists have called the attention of the N. F. Committee to this error before this? This gives us the further lesson that before making any formula official, either in the National Formulary or the U. S. Pharmacopœia, the formula should be actually tried by several members of the committee, and other pharmacists and criticisms should be invited.

Furthermore, the N. F. orders 50 parts of sodium bicarbonate to be dissolved in the last wash-water, evidently to remove the last traces of acid. The presence of sodium bicarbonate, however, is unnecessary; it is not needed in a rightly constructed formula; in fact, it is objectionable as it has a tendency to transform some of the freshly precipitated bismuth hydroxide into carbonate.

#### STOECHEIOMETRIC CALCULATION.

In order to check my practical experiments, I also made use of the theoretical part, *i. e.*, stoichiometry. The following are the equations and quantities in the manufacture of bismuth hydroxide.



500 Gm. official nitric acid = 340. Gm. absolute  $\text{HNO}_3$ .

minus 125.14 required to convert the bismuth subnitrate into trinitrate.

leaves 214.86 Gm. uncombined  $\text{HNO}_3$ .

This latter requires 581.36 Gm. ammonia water, 10 per cent., for neutralization.

507.90 Gm. ammonia water required to precipitate the trinitrate into hydroxide.

1089.26 Gm. total ammonia water.

That is, it requires 1089.26 Gm. ammonia water for 500 Gm. nitric acid (500 Gm. being the N. F. quantity). The N. F., however, instead of requiring 1090 Gm. ammonia water, only orders 600 Gm.

Through numerous experiments I find that in order to have the supernatant liquid strongly alkaline, which is absolutely necessary, it requires about three times as large a *volume* of 10 per cent. ammonia water as of 68 per cent. nitric acid.

#### PRACTICAL EXPERIMENTS.

My object being to obtain the precipitated bismuth hydroxide in as fine, bulky and fluffy a powder as possible, I made a great many experiments regarding certain points, with the following results:

1. Dilution of the two solutions. I came to the conclusion that the more dilute the two solutions are, the finer and bulkier will be the precipitate.

2. Temperature of the two solutions; the colder these are the fluffier will be the precipitate.

3. Method of precipitation. The dilute bismuth trinitrate solution should be poured quickly, *not slowly and with constant stirring* as the National Formulary directs, into the very dilute ammonia water, which latter must be in excess.

4. Reaction of the mixed solutions. It is best to test the supernatant fluid so as to be positive that it is alkaline. The point that the ammonia is in excess is very important in order to obtain a true bismuth hydroxide. The precipitated  $\text{Bi}(\text{OH})_3$  is insoluble in water and also in excess of alkali.\*

5. Precipitation and washing of the precipitate. The bulkier the precipitate, the longer it will take to subside.

My method is to allow the precipitate to subside well over night and syphon off the supernatant liquid as completely as possible in the morning. I prefer syphoning to decanting as thereby the precipitate will not be disturbed or wasted, and the liquid can be removed more completely. I wash the precipitate and then syphon off the liquid three times. While distilled water is no doubt the best, I found, as in my process for Magma Magnesiae,† that hydrant water filtered through a Berkefeld (kiesselguhr) filter will answer just as well, and will not discolor the precipitate. Lastly the magma of bismuth hydroxide is poured on a muslin strainer in order to drain it.

6. Temperature of drying the precipitate should be the ordinary temperature. If heat is employed then it must be a gentle heat of about  $38^\circ \text{C}$ . ( $100^\circ \text{F}$ .) The lower the temperature the better, in my opinion. Most books, the French Pharmacopœia included, order this precipitate to be dried at  $60^\circ$  to  $70^\circ \text{C}$ . ( $140^\circ$  to  $158^\circ \text{F}$ .) Such an authority as our honorary member, Prof. Ernst Schmidt (Marburg), whose work on bismuth and especially bismuth subnitrate is well known, also states ‡ that the precipitate should be dried at ordinary temperature. Professor Schmidt further states: At  $100^\circ \text{C}$ ., and even in drying the  $\text{Bi}(\text{OH})_3$  is partly changed to  $\text{BiO}(\text{OH})$  (Carnelly, Walker).

#### PROPOSAL FOR AN IMPROVED N. F. TITLE AND FORMULA.

Bismuthi Hydroxidum.

Bismuth Hydroxide.

(Hydrated Bismuth Oxide.)

Bismuth subnitrate .....	300 Gm.
Nitric acid.....	300 Cc.
Ammonia water .....	1000 Cc.
Distilled water, a sufficient quantity.	

\* Douglas and Prescott, Chemical Analysis, 1885, p. 92.

† Proc. A. Ph. A., Vol. 55, p. 150; American Druggist, September 23, 1907.

‡ Pharmazeutische Chemie, 1907, Vol. 1, p. 450.



Mix the bismuth subnitrate with 200 Cc. of distilled water in a 1000 Cc. flask, add 225 Cc. of nitric acid, and promote the solution of the salt by agitation, and, if necessary, by a gentle heat. Filter this solution through absorbent cotton into 5,000 Cc. of distilled water, previously acidulated with 50 Cc. nitric acid. Dilute the ammonia water with 12,000 Cc. of distilled water in a glazed or glass vessel of double that capacity, and pour into it quickly the bismuth solution. Dilute the remaining 25 Cc. of nitric acid with 1000 Cc. of distilled water, and with this, in several portions, rinse the flask, the filter and the vessel which contained the bismuth solution, so as to avoid any loss of bismuth, and pour these rinsings into the dilute ammonia water. Test the mixed liquids, and if not distinctly alkaline add a sufficient quantity of ammonia water. Let the mixture stand during six hours, so that the precipitate may subside, then pour off or better, syphon off the supernatant liquid, and wash the precipitate three times more by decantation, etc., with distilled water. Pour the precipitate upon a wetted muslin strainer and allow it to drain. Transfer the strainer to a warm place, not exceeding 60° C. (140° F.), so that the precipitate may dry. Then powder and keep in well-stoppered bottles.

Average dose: 0.500 Gm. = 500 milligrammes ( $7\frac{1}{2}$  grains).

NOTE.—If the bismuth solution is poured slowly and with constant stirring into the ammonia solution, then the resulting precipitate will be heavier and denser.

In conclusion I beg to state that the note N. F., iii, p. 5, regarding cream of bismuth, ought to be dismissed, as the given formula does not produce a satisfactory homogeneous preparation. I have experimented considerably with this cream or milk of bismuth, but limited time did not permit me to complete the experiments. I shall give it further attention and report the results at the next meeting, in a paper on magma bismuthi for internal, as well as cosmetic use.

Mr. Hynson moved that the paper be received and referred to the Publication Committee, and that the corrections recommended be referred to the special Committee on Correction of the National Formulary. This motion was seconded by Mr. Hallberg.

Mr. Asher said he did not know whether he was exactly in order in speaking of bismuth hydroxide, but in his section of the country a great deal of so-called "cream of bismuth" was used, and while the original bismuth of the French Codex was bismuth hydroxide, he wanted to say that all the bismuth that was sold by the various proprietary houses in his section was not hydroxide, but subcarbonate.

He said: Just add a little acid and you will find the subcarbonate. Regarding the making of cream of bismuth, he said he had had fifteen years' experience in that matter; the method he used was to add an equal amount of water to the required acid, and add the bismuth to that mixture, when solution takes place immediately, then precipitate

with sodium carbonate. The bismuth nitrate solution is poured into the sodium carbonate solution.

The Chair put the vote on the motion to receive the paper and adopt the accompanying motion of Mr. Hynson, and it carried.

The Chair stated that a paper by William C. Kirchgessner, of Grand Rapid, Mich., on "Useful Formulas for Useful People," would be read by title only, and passed for publication in the Proceedings, as the author was not present. The full text of said paper here follows.

#### USEFUL FORMULAS FOR USEFUL PEOPLE.

BY W. C. KIRCHGESSNER, GRAND RAPIDS, MICH.

##### *Elixir of Diethylbarbituric Acid (Veronal).*

Diethylbarbituric acid .....	18 Gm.
Compound tincture of vanillin (N. F.) .....	16 Cc.
Alcohol .....	175 Cc.
Glycerin, a sufficient quantity to make .....	500 Cc.

Dissolve the diethylbarbituric acid in the alcohol, add the compound tincture of vanillin, and enough glycerin to make 500 Cc.

##### *Solution of Iron, Manganese and Pepsin.*

Iron and ammonium citrate .....	30 Gm.
Manganese sulphate.....	3 Gm.
Glycerole of pepsin (1-10).....	30 Cc.
Alcohol .....	100 Cc.
Simple syrup. ....	100 Cc.
Tincture of orange.....	4 Cc.
Tincture of vanilla.....	4 Cc.
Aromatic fluidextract.....	2 Cc.
Acetic ether .....	0.5 Cc.
Ammonia water, a sufficient quantity.	
Distilled water, a sufficient quantity to make.....	1000 Cc.

Dissolve the iron and ammonium citrate, and the manganese sulphate in 500 Cc. of distilled water, add the glycerole of pepsin and a sufficient quantity of ammonia water to neutralize the solution, making a clear solution. Mix the alcohol, simple syrup, tincture of orange, tincture of vanilla, aromatic fluidextract and acetic ether. Add to the above solution, then add a sufficient quantity of distilled water to make 1000 Cc. Filter if necessary.

##### *Compound Elixir of Hexamethylenamine.*

Saw palmetto berries, granulated .....	125 Gm.
Corn silk, ground.....	125 Gm.
Sandalwood, ground.....	31.25 Gm.
Hexamethylenamine .....	41 Gm.
Simple syrup.....	125 Cc.
Compound spirit of orange (U. S. P.).....	10 Cc.
Alcohol.	
Distilled water, of each, a sufficient quantity to make... ..	500 Cc.

Mix the drugs and moisten them with 8 fluidounces of a mixture of alcohol 1 part, and water 2 parts, and allow to macerate for 48 hours. Pack into a percolator; then add enough menstruum of the same proportions as aforementioned to make 360 Cc. of percolate. In this dissolve the hexamethylenamine, then add the compound spirits of orange and simple syrup. Filter if necessary.

By showing these preparations to the physicians they can be induced to prescribe them in place of those proprietary products which are similar in composition.

The Chair stated that Mr. Dunning, of Baltimore, would now discuss "Some Interesting Prescriptions," which he had gathered from time to time. Mr. Dunning presented his subject by putting up before the members, one at a time, a dozen or more prescriptions in magnified form, containing peculiarities or difficulties that he wished to call to the attention of his auditors. These prescriptions elicited a good deal of informal discussion and suggestion by the members as to how they would, individually, have dispensed them, or dealt with the trouble pointed out, and then Mr. Dunning would tell of his own method of manipulation and the results attained.

## SOME INTERESTING PRESCRIPTIONS.

BY H. A. B. DUNNING.

## No. 1.

R	Acid-salicyl.....	3i
	Urotropin .....	3iss
	Aq. menth. pip. ....	3vi

## No. 2.

R	Balsam. tolu .....	3ii
	Ol. rosemar .....	min. xx
	Tr. canthar .....	3iv
	Ol. ricini .....	3i
	Adipis præpar .....	3i

M. ft. ungt.

## No. 3.

R	Stront. bromid.....	3iv
	Sodii bromid .....	3ii
	Sodii bicarb .....	3iv
	Ess. pepsin .....	ad 3iii

M.

## No. 4.

R	Ferri et quinin. cit.....	3i
	Tr. ferri chlorid.....	3i

M. ft. sol.

## No. 5.

R	Asafoetidæ .....	gr. ii
	Creosoti .....	min. ii
	Salol.....	gr. ii

M. ft. cap. i. Tales doses No. xxiv.

## No. 6.

R	Ferri et ammon. cit. ....	3i
	Potass. citrat. ....	3ii
	Liq. potass. arsenit. ....	3i
	Tinct. nucis vom. ....	3vi
	Tinct. cinchon. comp. ....	ad 3iv

M.

## No. 7.

R	Acid. carbol. cryst. ....	gr. xx
	Resorcin. ....	gr. xxx
	Petrolat. ....	3i

M. ft. ungt.

## No. 8.

R	Quinin. muriat. ....	gr. xxxii
	Acid. hydrobrom. dil. ....	3i
	Elix. eriodictyi aromat N. F. ....	q. s. 3ii

(N. F.)

## No. 9.

R	Sodii salicyl.	
	Sodii bicarb. ....	
	Sodii biborat. ....	aa 3i
	Acid. carbol. ....	gtt. xx
	Ol. cassiæ. ....	gtt. iv
	Aquæ. dest. ....	q. s. 3x

## No. 10.

R	Plumbi. acetat. ....	3i
	Zinc. sulph. ....	3i
	Pulv. opii. ....	gr. iii
	Aquæ dest. ....	3iii

## No. 11.

R	Ext. opii. ....	gr. xv
	Ext. cascariæ. ....	gr. L
	Resorcin. ....	3ii

M. ft. caps. No. xxiv.

## No. 12.

R	Beta-naphthol. ....	3i
	Salol. ....	3i
	Asafoetidæ. ....	3i

M. ft. cap. No. Lx.

## No. 13.

R	Potass. bromid. ....	3iv
	Potass. iodid. ....	3iii
	Acidi boric. ....	gr. iiii

M.

The Chair here gave Mr. Searby an opportunity to make an announcement to the effect that the Committee on Time and Place would meet at nine o'clock this evening, at which time the question of where the Association would meet next year would probably be decided.

A paper by Joseph Weinstein, entitled "Pharmacy's Unexplored Field," was read by title and referred to the Committee on Publication. The text of said paper here follows :

#### PHARMACY'S UNEXPLORED FIELD.

BY JOSEPH WEINSTEIN, PHAR. D.

More and more the perceptive powers of the present-day pharmacist are being gradually called into requisition along other lines beside that of pure pharmacy. Broader and greater is his field of usefulness becoming, and as his responsibilities increase, likewise are his virtues manifestly developed.

The pharmacist as we have found him in the past, and as we find him in the present is in no wise a nonentity, especially in so far as the sciences are concerned, for we not only observe him as a pharmacist and chemist, but at times we greet him as a botanist, physiologist, pharmacologist, toxicologist, and lastly a bacteriologist.

It is upon this last adoption that I beg leave to particularly emphasize the hidden knowledge that awaits pharmacy in the direct application of the science to the greater needs of pharmaceutical demands. The scope of the present paper can but in a correlative manner bring a slight notice to possibilities that bacteriology has, if properly accorded the attention in the utilization of its value in pharmacy as has been given it in preventative medicine. There seems to be no reason why pharmacy cannot use the science to its mutual advantage as medicine has done to such a virtuous degree, for as the two professions stand they are inseparable, and therefore have greater reasons to exist as helpmates.

Bearing more closely upon the subject-matter, it might be well to preliminarily state that in the lower forms of vegetable life we find a perpetual force that has been going on for ages, and even up to the present decade we find this same force continuing with greater activity to-day, but with a broader exemplification of its powers, due entirely to our advanced conception of the same, and withal, pharmacy has been in a great measure loath to avail itself of its powers. Medicine has made rapid strides, dependent upon the knowledge advanced in bacteriology, and there seems to be even greater reason why pharmacy should likewise profit by the existence of the powers and usages of the lower forms of vegetable life, collectively called microorganisms.

Drawing closer to the point at issue, it might be well in a brief manner to refresh the mind as to just what the functions of microorganisms are. Our present-day knowledge tells us that they are, in a broad sense, "the scavengers of the living and the dead," but more clearly an organized band of protectors. For while the germs or bacteria are continually destroying matter, we find them at the same time going on to rebuild matter, so that this unseen force perpetually destroys and reconstructs *ad libitum*.

The universal idea that germs, like pharmacists, are all alike, *i. e.*, exceedingly bad, is not true, for we have many that are extremely good, and inasmuch as they do no harm we pay but little attention to them, for what concerns us most is the "bad ones." Since they are present everywhere, we may ask ourselves what are microorganisms anyway, and what are they capable of doing?

In the first place microorganisms, which embrace all forms of bacteria, are not "insects" or "bugs," as some will have us believe, but plants. Unlike many plants, they have the power of locomotion, and like most living bodies, take in matter and potential energy, and give off matter of a similar nature and manifest energy. In common with all colorless plant life they exist by virtue of organic food, but this is not dependent upon proteid matter entirely. By virtue of their power to absorb nitrogen and sulphur from inorganic matter, and carbon from organic matter, they are then capable by their intricacies of manipulation to build up proteid matter in the presence of moisture, and then turn around and deplete their own creation. They can exist with or without the presence of oxygen to a limited degree, but generally take in oxygen and give off carbon dioxide. This wonderful feat of freeing oxygen from complex bodies by really no visible apparent means is an act that demands more than a passing glance. It is upon this peculiar phenomenon, over which we do not have to dwell very extensively, that the field of exploration to pharmacy's credit is widely open.

As an illustration of the foregoing let me call your attention to the well known process of fermentation in the production of all of our spirituous beverages. With a little fostering these minute bodies will go on, and in the ultimate results produce that which has quenched the thirst of all nations. If for some reasons they should cease to exist, pharmacy and chemistry would lose an invaluable aid to the development of many necessities.

For years we have been concerning ourselves about insects, bugs, animals, etc., that have been destroying our drugs in countless masses. This work has been productive of good results. But what about the destruction of products caused by microorganisms? This is forcibly noticed in the various medicated waters and solutions.

We are told by an investigator, Dr. J. Van Cott, working in the Berlin Hygienic Institute, that by experiment he has found the bacteria of malignant edema in tincture of musk, the presence of which he attributes to the cysts or bags which contain the musk.

Pasteur, working on racemic acid, was capable of splitting it up into dextro- and lævo-tartaric acids by the use of *Penicillium glaucum* and beer yeast.

Lewkowitch, likewise, took inactive mandelate of ammonium, and by using *Penicillium glaucum*, or *Bacterium termo*, produced in each case a

dextro-rotary product, when on using *Saccharomyces elipsoideus* the dextro product was consumed and left the lævo product as a separate experiment.

We also find a soil bacterium that fixes nitrogen, replenishes worn-out soils and produces luxuriant crops. This to-day is being exploited commercially.

Winogradsky writes about an iron bacterium that has the power of converting ferrous carbonate into the oxide. The bacterium depends on the carbonate for development. Leaving the well-established fact of oxygen interference out of the question, it is rather a sane opinion that this particular bacterium may have a side influence in altering our Bland's mass, which all of us are conversant with. The same worker also acquaints us with the existence of a bacterium that plays an important part in splitting up the various elements and sulphur compounds found in sulphur springs into hydrogen sulphide. This form may no doubt be developed into an economical means of separating the heavy metals, which, of course, awaits the application.

To Warrington is accredited an organism obtained from meadow soil, which when cultivated in a solution of ammonium chloride and calcium carbonate, oxidizes ammonia to nitrous acid, but has no effect on nitrates, and following this, Winogradsky has found the ferment that will convert nitrites into nitrates.

The existence of the great Chili beds of saltpetre is due to the efforts put forth by the ceaseless array of nitrogen bacteria. For them to refuse to work would mean the collapse of a gigantic and profitable industry.

E. Wallny claims that the oxidation of carbon to carbon dioxide is dependent upon a soil bacterium 500,000 strong per gram of soil. No doubt we may some day turn the attention of these organisms to the charging of our soda fountains—who can tell?

While we are not particular as to how we get ammonia, Muntz tells us that by virtue of a ferment in soil organic nitrogen is converted into ammonia preparatory to nitrification. Let us hope some day ammonia water will be made like lime water and may we look forward to such a process.

We not only have bacteria that produce gases and salts, but we have them producing colors, such as red, blue, violet, green and yellow, in fact every color of the rainbow, and in view of the late enactment relative to food and drug coloration, it might be well to state that these, being vegetable colors, may to advantage be employed in coloring many of our pharmaceutical preparations.

Another illustration that microorganisms take the place of chemical reagents in forming new chemical compounds is evidenced by the lactic acid fermentation, and Professor Metchnikoff, the great worker along this line, has given us results which may be looked upon as our modern "Elixir ad longam vitam."

Since the foregoing portion of this paper deals with the theory of the wide application of bacteriology in pharmacy and its utilization in the future, it therefore follows that a few words on the practical side of bacteriology in the present-day pharmacy would no doubt not go amiss.

It is a well known fact that a more direct diagnosis of many obscure lesions is dependent greatly on the knowledge gleaned from the science of bacteriology, so much so that the greater number of physicians place extreme confidence in the results as determined by these means. The work of bacteriology is being rapidly relegated into the hands of the pharmacist by virtue of his kinsmanship to the medical profession, his training in chemistry, his general knowledge of technics and his appointments and time to devote to the work. The time is not far off when every pharmacy, to be well equipped, will have not only a chemical department, but a bacteriological laboratory as well, in which investigations may be conducted with a certainty. Our more successful brethren have thus far advanced in having taken up the work of chemical and microscopical uranalysis, which occupation is both profitable and dignified, and the time is now at hand where demands are numerous along the lines of bacteriology.

The scope of this paper is such that it cannot at this time go into details as to the methods involved in this line of work; suffice it to state that the examinations a pharmacist would be called upon to more generally perform are: The examination of sputum for tubercle bacilli, pneumococci, elastic fibres, Curchman's spirals and, in some rare cases, the bacillus of influenza; the examination of secretions and excretions for pus, elements of malignancy and pyogenic bacteria, the examination of exudates and trans-exudates and the specific determination of the diphtheritic bacillus are items that pharmacists to-day are often called upon to do in view of the lack of time experienced by the busy practitioners. The examination of blood for malarial parasites, the counting of red and white corpuscles, the estimation of hemoglobin and the execution of the Vidal reaction for typhoid are of great importance and can easily be carried out by the experienced pharmacist. And last, but not least, the determination of the opsonic index, which is becoming of such concern, may be undertaken with satisfaction.

The bacteriology of water is becoming of just as much, if not more, importance than the chemical part, and by virtue of a complete outfit, the methods involved should not deter the progressive pharmacist from doing the work correctly.

As the time draws nigh when every drug store will be known as a laboratory, let us hope that these few words will convey the sounding word of warning.

A paper by Henry C. Blair, entitled, "Construction of Official Formulæ," was, on motion of Mr. Hallberg, received and referred to the Association Committee on U. S. P. The text of said paper here follows:



## CONSTRUCTION OF OFFICIAL FORMULÆ.

BY HENRY C. BLAIR, PHILA., PA.

Those who have carefully considered the question of standard formulas and the recognition by the United States government of the U. S. Pharmacopœia and the National Formulary, will agree that there is no necessity for two books, and it is probable that the next Pharmacopœia will contain information concerning all of the chemicals, drugs, pharmaceutical preparations and substances used in medicine and surgery.

It is conceded by every one that many of the formulas in the National Formulary are not what they should be, and even some of those in the U. S. Pharmacopœia can be greatly improved.

The Pharmacopœia is supposed to be a guide for pharmacists and physicians, not only to set standards, but also to direct the making of pharmaceuticals, etc., in the proper way.

Allowing that these are the facts, it is imperative that all formulas for pharmaceutical preparations be as exact, plain and simple as possible, and with the question of expense and expediency taken into account. To this end, scientists and experts on chemistry, materia medica, pharmacy, therapeutics, etc., are necessary, but the most important of these for the work of properly constructing formulas are the doctor and the druggist, who are actively engaged in their professions.

The doctor knows whether he wants all medicinal elixirs to be made from aromatic elixir or whether he would like a change for his patients once in a while.

The druggist is not so penurious that he will buy only oil of orange, oil of lemon, oil of coriander, and oil of anise. He frequently has twenty or thirty other aromatic oils on his shelves.

The doctor knows that one part of cresol and one part of green soap make a preparation quite as good as the complicated formula in the Pharmacopœia for liquor cresolis comp.; and the druggist knows that so-called fig-soap, made from olive oil and potash, costs about one-third as much as linseed oil soap, and that it is a better substance for the purpose.

Every one knows that the large soap-makers can produce finer soaps at a much lower price than can a pharmacist, or manufacturing pharmacist, for soapmaking is a special business, and unless it is done on an enormous scale it is not profitable.

A simple statement concerning the elixirs seems to the writer to be evidence enough of having practical pharmacists actively engaged on the work of constructing formulas for official use. We have only three elixirs in the U. S. Pharmacopœia; of these one is medicinal, the other two simple. Of the simple elixirs one is made by adding fluidextract of licorice to the other one. The simplest one requires a finished preparation; hence it should be made from essential oils.

There are eighty-nine elixirs in the National Formulary—seventy-five

contain aromatic elixir and why the other fourteen do not is a mystery unless, perhaps terpin hydrate is not soluble in it, and compound elixir of chloroform is not an elixir, and so on.

As far as possible, elementary substances should be used. A finished preparation has cost something in time and money to make, and each time one is used in making another preparation something is added to its cost.

For example: Aromatic wine of coca of the National Formulary requires four finished preparations, and these four require ten, making in all fourteen finished preparations, each of which has taken time and labor, not to mention filter papers, talc, etc.

Would it not be better in every way to pick out from the eighteen substances entering into the composition of aromatic wine of coca, N. F., those that are necessary medicinally and those we desire for vehicles and flavor, thus making a good preparation at little expense, and one that would not make us feel that we had given ourselves a pharmaceutical training for nothing.

If the pharmacist is given a medicinal substance, and informed as to the dose, he should be able, with a very few experiments, to make a palatable and attractive preparation, superior to any proprietary preparation, and differing in color and flavor from other preparations. Pharmaceutical preparations should differ in color, taste, appearance and smell, from each other, so that physicians and pharmacists can readily tell them apart, and the public be given a variety in taste.

A paper on iodine solutions, by F. W. Nitardy, was also, on motion of Mr. Hallberg, received and referred to the Committee on U. S. P. of the Association. Said paper here follows:

#### NOTES ON SOME OFFICIAL IODINE SOLUTIONS.

BY F. W. NITARDY, CHICAGO, ILL.

##### TINCTURE OF IODINE. U. S. P.

The formula calls for: Iodine 70 Gm., potassium iodide 50 Gm., and alcohol q. s. 1000 Cc., directing the iodine and potassium iodide to be powdered and dissolved in the alcohol by agitation.

Owing to the fact that this preparation represents a nearly saturated solution of iodine and potassium iodide in alcohol, complete solution takes place rather slowly, requiring several days with proper attention. It is well known that iodine is very soluble in a saturated solution of potassium iodide in water. In view of this fact it seems the following modified formula represents an improvement over the present official one:

Iodine .....	70 Gm.
Potassium iodide.....	50 Gm.
Water .....	35 Cc.
Alcohol, a sufficient quantity to make.....	1000 Cc.

Introduce the iodine, potassium iodide and water into a graduated flask

or bottle, shake until completely dissolved, and add sufficient alcohol to make the finished tincture measure 1000 Cc.

As alcohol is not the active constituent of this preparation, its value is in no way reduced by the introduction of  $3\frac{1}{2}$  per cent. of water; while the saving of time is considerable since only a few minutes are required for the preparation of tincture of iodine by this method.

In several official preparations containing iodine, potassium iodide and water, the potassium iodide solution used as a solvent for the iodine is made entirely too dilute. Considerable time and work can be saved by modifying the working directions of these preparations to the extent of making a concentrated solution of the potassium iodide, dissolving the iodine in this solution and then adding the remaining water.

In the following formulas the indicated modification seems advisable :

## LIQUOR IODI COMPOSITUS. U. S. P.

*Official Formula.*

Iodine ..... 5 Gm.  
Potassium iodide..... 10 Gm.  
Distilled water ..... q. s. 100 Gm.

Dissolve the iodine and potassium iodide in a sufficient quantity of distilled water to make the product weigh 100 Gm.

*Improved Formula.*

Iodine ..... 5 Gm.  
Potassium iodide ..... 10 Gm.  
Distilled water ..... q. s. 100 Gm.

Dissolve the iodine and potassium iodide in 10 Cc. of distilled water, then add a sufficient quantity of distilled water to make the product weigh 100 Gm.

## IODINE TEST SOLUTION. U. S. P.

*Official Formula.*

Dissolve 1 Gm. of iodine and 3 Gm. of potassium iodide in 50 Cc. of distilled water.

*Improved Formula.*

Dissolve 1 Gm. of iodine and 3 Gm. of potassium iodide in 3 Cc. of distilled water, when dissolved add 47 Cc. of distilled water and mix.

## TENTH-NORMAL IODINE VOLUMETRIC SOLUTION. U. S. P.

*Official Formula.*

Dissolve 12.59 Gm. of pure iodine in a solution of 18 Gm. of potassium iodide in 300 Cc. of distilled water. Then add sufficient distilled water to make the solution measure, at 25° C., exactly 1000 Cc.

*Improved Formula.*

Dissolve 12.59 Gm. of pure iodine in a solution of 18 Gm. of potassium iodide in 15 Cc. of distilled water. Then add sufficient distilled water to make the solution measure, at 25° C., exactly 1000 Cc.

## LINIMENTUM IODI. N. F.

*Official Formula.*

Iodine ..... 125 Gm.  
Potassium iodide ..... 50 Gm.  
Glycerin ..... 35 Cc.  
Distilled Water ..... 65 Cc.  
Alcohol, a sufficient quantity to make ..... 1000 Cc.

Mix 750 Cc. of alcohol with the other ingredients and dissolve the solids by agitation. Then add enough alcohol to make 1000 Cc.

*Improved Formula.*

Iodine ..... 125 Gm.  
Potassium iodide..... 50 Gm.  
Glycerin ..... 35 Cc.  
Distilled water..... 65 Cc.  
Alcohol, a sufficient quantity to make ..... 1000 Cc.

Dissolve the iodine and potassium iodide in the distilled water. Then add the glycerin and sufficient alcohol to make the product measure 1000 Cc.

The Chairman here asked the Secretary to take the chair while he read his own paper on "Some New Elixirs." Mr. Apple presented his paper as follows, calling attention to some samples of his products placed on the table for the inspection of the members :

# NOTES ON SEVERAL NEW ELIXIRS.

BY FRANKLIN M. APPLE, PH. G.

Inasmuch as revisions of the U. S. P. and N. F. are assured within the next few years, it is an opportune moment to offer the formulæ for several new elixirs, which have proven satisfactory in every respect.

Attention has been called, by some writers, to the similarity of flavor of the official elixirs; also to the high alcoholic strength of the U. S. P. aromatic elixir, which has been the cause for severe condemnation thereof, hence it has been my aim to originate several elixirs with distinctive flavors, differing from the U. S. P. aromatic elixir in that respect; also being more desirable, owing to a reduction of the alcoholic strength.

The results of repeated experiments are offered for your consideration:

## Elixir Dulce (Elixir Aromaticum).

### Sweet Elixir (Aromatic Elixir).

Anethol .....	12	minims.
Oil of coriander .....	1½	minims.
Oil of myristica .....	2	minims.
Tincture of vanilla (U. S. P.) .....	1	fluid drachm.
Alcohol .....	6½	fluid ounces.
Simple syrup.		
Distilled water, of each a sufficient quantity to make..	32	fluid ounces.
Purified talc .....	1	ounce.

Prepare according to the directions given for the preparation of the U. S. P. aromatic elixir.

## Elixir Aurantii Florum Compositum.

### Compound Elixir of Orange Flowers.

Oil of cinnamon (U. S. P.) .....	6	minims.
Alcohol,		
Stronger orange flower water, of each .....	6	fluid ounces.
Simple syrup .....	12	fluid ounces.
Distilled water .....	8	fluid ounces.
Purified talc .....	1	ounce.

Prepare according to the directions given for the preparation of the U. S. P. aromatic elixir.

After critical comparison of the sweet elixir with the U. S. P. aromatic elixir, every physician in my vicinity expressed a preference for the former one.

The use of orange as a flavoring oil or essence is quite limited indeed; and the name of the official preparation leads one to expect a more agreeably aromatic product.

Upon preparing the official adjuvant elixir with sweet elixir, the vast superiority of the latter over aromatic elixir U. S. P., as a base, is immediately noticed.

The blending of the odors is so balanced that it creates an inquiry as to what it is composed of, which produces a very desirable mental effect upon the patients.

'Tis true that we have elixir of anise N. F., which to my mind is a misnomer, but the alcoholic strength thereof is 24 per cent., and the amount of anethol used is too great to permit of its use as a general vehicle. Its chief use lies in its carminative properties—look at the dose given for it. The very low percentage of distilled water and the relatively high percentage of simple syrup makes of it a very poor solvent.

The compound elixir of orange flowers is recommended as a base for those elixirs, which contain saline salts, as its spicy taste makes it very acceptable as a vehicle for that class of remedies.

Whereas the American Medical Association has condemned the compound digestive elixir N. F., and suggested that it be expunged from the list of official preparations; also, inasmuch as many medical practitioners have stated that they have prescribed various proprietary products, as vehicles, owing to their beautiful red color and aromatic taste, there can be no question that an elixir meeting the demands of these practitioners should be made official.

The following product will meet the demands of the most exacting physicians:

Elixir Dulce Rubrum (Elixir Aromaticum Rubrum).

Red Sweet Elixir (Red Aromatic Elixir).

Tincture of cudbear (N. F.), .....	6 fluid drachms.
Compound tincture of cudbear (N. F.), .....	2 fluid drachms.
Sweet elixir, a sufficient quantity to make .....	16 fluid ounces.

Mix.

Allow to stand for 48 hours, if possible, and filter.

Your attention is directed to the rich, ruby-red color of this preparation, which surpasses that of any proprietary product that has come to my notice. The elixir is neutral in reaction—a distinction from compound digestive elixir.

Incidentally I wish to call attention to the fact that when tr. cudbear N. F. and comp. tr. cudbear N. F. are mixed in the above proportions, a very beautiful red color results upon dilution thereof—one free from the purplish tint of the dilutions of tr. cudbear N. F.; also free from the brownish tint of the dilutions of comp. tr. cudbear N. F.

The relatively low cost of these elixirs is another factor in their favor.

On motion of Mr. Asher the paper was received, to take the usual course. Mr. Beringer stated that this problem of elixirs and their alcoholic con-

tent was one that had been taken up by the U. S. P. committee, and it already had that work in hand ; so these formulas submitted by Mr. Apple came at a particularly opportune time.

Mr. Hallberg, seconded by Mr. Mayo, moved to refer the paper to the Committee on National Formulary, and this motion was adopted.

Mr. Apple called attention to the sample bottles in which these preparations exhibited were put up—something which would prevent the physician from handing these to his patients ; the idea being to have something different from the ordinary prescription bottle, so the doctor would use it only as a sample bottle. Mr. Apple said that he would advise in sampling physicians to use a bottle that was distinctive—one that would not suggest the ordinary prescription bottle.

Mr. Apple resumed the Chair, and called for a paper on "Simple Elixir" by F. J. Blumenschein, of Pittsburg. As the author was not present, Mr. Mayo moved to read by title and refer to the Committee on U. S. Pharmacopœia. This motion was adopted.

#### SIMPLE ELIXIR.

BY FRED. J. BLUMENSCHIEIN, PITTSBURG, PA.

Simple or aromatic elixir of the U. S. P. when properly prepared from selected materials, has much to recommend it over other vehicles and by many even claimed to be the best, at least the so-called "elegant Pharmacy" would be nil without it.

But its rare flavor can only be obtained by exercising the greatest care in its manufacture which is not so simple as the name might imply. In the manufacture of an elixir, there are many important points to be taken into consideration, such as the filtration, the selection and solution of the oils and the sugar and it is essential that the finished product be not deficient either in aromatic qualities or alcohol.

Having had considerable experience in the manufacture of simple elixir, many methods for its preparation have been suggested and tried, the following having proved the most satisfactory, is offered with the confidence that if followed carefully, gratifying results will be obtained.

Now the first step is to dissolve the oils, (as in compound spirit of orange) and the first thought should be to keep them in solution as long as possible.

In the U. S. P. the directions are to add the syrup, then the water to the solution of oils in alcohol and to finally add the purified talc. Yet this is all directly against the better precepts of Pharmacy, inasmuch as the oils are precipitated upon the sides of the bottle from where they must be dissolved in the liquid by shaking with purified talc, or the oils are precipitated in such an extremely minute state that the globules remain suspended in the liquid which causes still more trouble when filtration is

attempted, because these very small globules pass through the paper and that means that the liquid must be repeatedly returned to the filter which every pharmacist knows is tedious and trying, of course in either case, solution of the oils may not be effected.

Using the same ingredient, but in different rotation (the syrup being formed in the process), will yield a superior product more quickly and easily prepared.

## THE FORMULA.

Compound spirit of orange .....	12 Cc.
Sugar .....	319 Gm.
Purified talc.....	30 Gm.
Alcohol.....	250 Cc.
Distilled water, sufficient to make 1000 Cc.	

To the purified talc and sugar contained in a suitable bottle, add the compound spirit of orange and alcohol, then in small portions, at intervals of from fifteen to thirty minutes, add enough water to make 1000 Cc., agitating vigorously after each addition.

When all the water is added it is allowed to stand as long as convenient, twenty-four hours or longer, although this is not necessary, and filtered, and afterwards washing the filter with a mixture of one volume alcohol and three volumes distilled water, to make 1000 Cc.

Made in the manner above described filtration proceeds rapidly and the filtrate is sparklingly transparent from the very first portion which flows.

The reason for this is that when the water is added to the alcoholic solution of oils, it gradually precipitates them, and this precipitate is deposited upon the surfaces of the minute particles of talc, and also upon the surfaces of the crystals of sugar, and thus the sugar is made to serve the part of the intervening body (*i. e.*, the sugar performs the function of the talc) and from these countless surfaces, the oils are again quickly dissolved by the liquid, at the same time the sugar is also gradually dissolved.

The superiority of this method may be tested by preparing a liter of elixir by the official process, and one by this modified process, when it will be found that the elixir prepared by the latter process filters in about one-half the time required by the U. S. P. method.

A paper by Mr. Raubenheimer, on "Linimentum Ammoniaë," was, on motion of Mr. Hallberg, received and referred to the Committee on U. S. Pharmacopœia of this Association. The Chair stated that the author of the paper had sent a number of samples illustrative of his text, but unfortunately most of them had been broken in transit. The full text of said paper here follows :

## LINIMENTUM AMMONIÆ, SNOW-WHITE AND PERMANENT.

BY OTTO RAUBENHEIMER, PH. G., BROOKLYN, N. Y.

As I pointed out in my paper, the liniments of the U. S. P.,\* read at the April meeting of the New York Branch American Pharmaceutical Association, the formula for ammonia liniment has been changed in every revision of our Pharmacopœia. The 1890 revision, so as to preserve the fluidity of the liniment, ordered the addition of 5 per cent. of alcohol as had been recommended already by Rother in 1872. In U. S. P. VIII 3 per cent. of oleic acid was added, undoubtedly with the object of forming a larger quantity of ammonium oleate and to increase the keeping properties of the preparation. In my opinion the addition of oleic acid was made from the fact that an old oil, somewhat rancid, that is, containing free oleic acid, will produce a more homogeneous ammonia liniment. Although the formula of the eighth decennial revision produces a superior liniment to the formula of previous revisions, nevertheless, the liniment is not quite satisfactory as yet, because it is of a yellowish color and separates and thickens by age. Furthermore the directions of the eighth revision which say that "This liniment should be freshly prepared when wanted" are impracticable. The pharmacist cannot very well mix the four ingredients together every time a nickel's worth of hartshorn liniment is called for.

## EXPERIMENTS WITH DIFFERENT OILS.

For a number of years I have experimented with ammonia liniment. I have tried all fixed oils from A (Adipis) to Z (Zæ maydis) as well as mixtures of different oils. I found that a mixture of equal parts of lard oil and cottonseed oil, † as shown in exhibit A, produces a creamy ammonia liniment which does not separate or thicken upon keeping to any extent.

When, however, during my experiments, I tried oil of sesame, I obtained an excellent ammonia liniment, one that was pure white and of the proper creamy consistence, and which did not separate or thicken in the slightest. This liniment (exhibit B) is so far superior to the ammonia liniment prepared from other oils, that I cannot help bringing it to the notice of the pharmaceutical profession, and especially to the American Pharmaceutical Association, since it affords me an opportunity to speak of the merits of sesame oil in the preparation of ammonia liniment.

## HISTORY OF OIL OF SESAME.

I am greatly indebted to Dr. Hermann Schelenz for the valuable information he has given me regarding sesamum in his splendid work on the

\* American Druggist, April 27, 1908; Deutsch-Amerikanische Apotheker Zeitung, June, 1908; *ibid.*, 1908; Drug Topics, July 11, 1908.

† American Druggist, April 27, 1908.



history of pharmacy.\* This great book, which gives the history of pharmacy and materia medica, as well from the oldest times to the present day, ought to be in the hands of every pharmacist who loves his profession, and especially every teacher.

Sesame belongs to the very oldest drugs, and was described by Hippocrates, whose work certainly represents the cornerstone of medical science.

Galen, the great physician-pharmacist, writes of *σισαμων*. Theophrastos,† the father and founder of botany, describes under the drugs of India, Sesame-Tila, from which the English word "teel" is derived.

Dioscorides,‡ that most important author, whose works on materia medica and pharmacology, were authoritative down to the sixteenth century, describes *Oleum sesami* "*quo Ægyptii utuntur*" (which the Egyptians use). The scope of this paper does not permit me to go into the history of sesame as deeply as I should have liked to, but I mean to reserve details for another paper at another time. The leaves of sesame were official in U. S. P., 1830 to 1870 inclusive. The oil has been, and is still, official in the Japanese, Hungarian and Russian pharmacopœias, and also in the *Ergänzungsbuch* (Supplement to the German Pharmacopœia).

*Oleum sesami* became official in the U. S. P., 1830 (1st rev.); unfortunately, however, it was dismissed from U. S. P., VIII. This step seems rather strange in view of the fact that the revisers of the foreign pharmacopœias are so convinced of the value of the oil, that it has been admitted to Pharmacopœa Nederlandica, IV, 1906; Pharmacopœa Austriaca, VIII, 1907, and Pharmacopœa Helvetica, IV, 1908.

#### HISTORY OF AMMONIA LINIMENT PREPARED FROM SESAME OIL.

Credit for the original use of sesame oil in the preparation of ammonia liniment is generally given to the great German worker, Eugen Dieterich. But Dieterich himself does not claim it as his own formula. He only states in the *Pharmazeutisches Manual*,|| that *oleum sesami* produces a better and more permanent ammonia liniment. Furthermore, the first edition of Dieterich's Manual appeared in 1887, and in looking around for the originator I found that F. M. Alcock, in the *Pharmaceutical Journal and Transactions*, as early as October 11, 1884, p. 282, made the following statement: "Sesame oil makes a more satisfactory liniment than olive oil or a number of other oils experimented with; even after standing three months there is no sign of separation, and the liniment presents a beautiful creamy consistency and color, but slightly altered during the time stated."

\* Schelenz, *Geschichte der Pharmazie*, Springer, Berlin, 1904.

† *Loco citato*, p. 57.

‡ *Loco citato*, p. 105.

|| 9th ed., 1904, p. 253, formula C.

Therefore, I reach the conclusion that ammonia liniment prepared from sesame oil was originated by the Englishman, Alcock. Upon investigation I find that several foreign pharmacopœias prepare their ammonia liniment from sesame oil.

The fourth edition of the Russian Pharmacopœia, and also the new fifth edition, published in 1906, order olive oil three parts, sesame oil one part, and ammonia water one part.

The second edition of the Hungarian Pharmacopœia (1888), the second edition of the Japanese Pharmacopœia (1891) and also the new third edition of 1908, order four parts sesame oil, and 1 part ammonia water, 10 per cent.

I am still more convinced of the merits of sesame oil in the preparation of ammonia liniment, because, during the last two years, three more pharmacopœias have replaced olive oil by sesame oil in their formulas for *linimentum ammonia*. The Netherlands Pharmacopœia IV, edit., 1906, and the Austrian Pharmacopœia, VIII, edit., 1907, order sesame oil, 80 parts, and ammonia water, 20 parts. The Swiss Pharmacopœia IV, edit., 1906, orders sesame oil, 75 parts, and ammonia water, 25 parts—I beg to explain here that although my formula, which I first prepared in June, 1907, and that of the Swiss Pharmacopœia, happened to be identical, I did not receive my copy of the Swiss Pharmacopœia until August, 1908.

It will be noticed that the Dutch and the Austrian Pharmacopœias order 20 per cent. by weight of ammonia water. I have tried this formula and exhibit a sample of the product (Exhibit C, prepared March 15, 1908). I find, however, that during the six months that have elapsed the liniment thus prepared has thickened very much, as may be seen by the sample. It is very likely, for this reason, that the Pharmacopœia Nederlandica Ed. IV. orders the ammonia liniment to be freshly prepared.

#### QUICK AND EASY METHOD.

My improved "quick and easy" method is simply to take

Sesame oil .....	3 parts by weight, not by volume.
Ammonia water.....	1 part by weight, not by volume.

Shake together in the bottle, which as you can convince yourselves (exhibit B), produces at once a pure white, homogeneous ammonia liniment of the proper consistence, not too thick and not too thin, which does not separate and does not thicken.

I prefer to weigh the two ingredients, as it is a great deal easier and also cleaner to weigh the oil, instead of measuring it. The next step I took was to use a mixture of sesame oil and cottonseed oil (exhibit D). This was made by taking sesame oil, 2 parts; cottonseed oil, 1 part; and ammonia water, 1 part.

I found, however, that as soon as any cottonseed oil was mixed with the

sesame oil it did not then produce a snow-white, but a yellow colored liniment which had the further disadvantage that it separated. I have therefore arrived at the conclusion that if you do not obtain a snow-white liniment, then your sesame oil is very likely adulterated with cottonseed oil, and distinctive tests, for instance, Halphen's test, should be applied for its detection.

Exhibit E represents an ammonia liniment of U. S. P. strength that contains sesame oil, 65 Gm., and ammonia water, 35 Gm. This is a nice, white liniment but rather too thin; it lacks the nice creamy consistence of sample B.

#### ADVANTAGES OF AMMONIA LINIMENT PREPARED WITH SESAME OIL.

(1) It is prepared "quickly and easily;" (2) it contains only two ingredients; (3) it is snow-white; (4) it is homogeneous, and does not separate into two layers; (5) it has that proper creamy consistence, not too thick and not too thin; (6) it is permanent and will not thicken by age.

Of course, I am fully aware of the fact that this liniment only contains 25 per cent. by weight of ammonia water, while the U. S. P. orders 35 volumes in 100 volumes. However, I consider this an advantage, as this liniment will not be quite so irritating as the U. S. P. preparation. I should very much like to have other pharmacists try this formula:

Sesame oil.....	3 parts by weight.
Ammonia water .....	1 part by weight.

and report what they think of it.

*Brooklyn, N. Y., August 9, 1908.*

A short paper by W. L. Cliffe, of Philadelphia, on "Limewater," was read by the Secretary, on motion of Mr. Mayo. The text of said paper here follows:

#### A METHOD OF PREPARING LIME WATER THAT ENSURES CONFORMITY WITH THE U. S. P. REQUIREMENTS.

BY W. L. CLIFFE, PHILADELPHIA, PA.

The plan proposed in this paper obviates all possibilities of carelessness or ignorance on the part of the operator in the following manner: After washing the calcium hydroxide in the usual manner, by decantation, sufficient water is added to make a creamy magma that is capable of being poured into one ounce bottles, which are then corked, sealed and stored in a box in the cellar. The contents of one bottle added to a gallon of distilled water makes standard lime water. There is practically no additional expense as the bottles can be re-used indefinitely.

On motion of Mr. Mayo, the paper was referred to the Committee on U. S. P.

A paper by F. W. Nitardy, on "Proposed N. F. Formulas," was read by title and referred to take the usual course. The full text of said paper here follows :

#### FORMULAS RECOMMENDED FOR INTRODUCTION INTO THE N. F.

BY F. W. NITARDY, CHICAGO, ILL.

Glyceritum Hydrastinæ Compositum.

Compound Glycerite of Hydrastine.

(Colorless Hydrastis.)

Hydrastine hydrochloride.....	5.00 Gm.
Aluminum chloride.....	5.00 Gm.
Dilute hydrochloric acid. ....	1.50 Cc.
Glycerin .....	500.00 Cc.
Distilled water, a sufficient quantity to make.....	1000.00 Cc.

Dissolve the salts in 100 Cc. of distilled water, add the dilute hydrochloric acid, and mix this solution with the glycerin. Then add a sufficient quantity of distilled water to make the product measure 1000 Cc.

Petrolatum Saponatum Iodatum.

"Iodized Liquid Petrox."

Iodine. ....	10 Gm.
Liquid saponated petrolatum N. F., a sufficient quantity to make..	100 Cc.

Mix them and dissolve by occasional shaking.

On motion of Mr. Asher, the following papers on "Dispensing Notes," by H. G. Posey, and "Safety Benzin," by Otto Raubenheimer, were received and referred, to take the usual course.

#### DISPENSING AND LABORATORY NOTES.

BY H. G. POSEY, NEW ORLEANS, LA.

In the daily routine of a busy prescription department, we are frequently called upon to solve various difficulties, which are farthest from the mind just a few moments before such difficulties present themselves.

The vast increase in therapeutic agents, and the manner in which they are indiscriminately prescribed in all varieties of combinations very often puts the pharmacist at his wits' ends to comply with the instructions of the prescriber and yet deliver to the patient a compound which will represent what the physician ordered and expected to get, but which, if compounded carelessly or without good judgment upon the part of the pharmacist, would probably not have the desired effect, or, in some cases, no effect whatsoever.

The writer was handed the following prescription not long ago :

R Thiosinamini.....	3iss.
Aquæ.....	f3ij.
M. et fiat Sol.	
Signa. For physician's use.	

As thiosinamin is insoluble in water, it could be of absolutely no service were it dispensed as written. The physician was called over the phone, and said that he wanted it for hypodermatic injection, eliciting some surprise at the time, when told that it would be necessary to add antipyrin in order to effect solution. He readily gave his consent to the use of the latter substance.

One of the favorite prescriptions of a very prominent physician of this section reads as follows :

R Tr. ferric chlor. ....	3ss.
Syr. hypophos. co. (U. S. P.).....	q. s. .... f3vi.
Misce.	

Now we all know what happens ; but that any number of dispensers do not know how to correct the condition, or do not care to do so, is only too evident from the number of bottles of a viscid, magma-like substance which have been shown me by both patients and prescriber. Why the physician will persist in using the tincture ferric chloride instead of citro-chloride I can't say, but it seems to me that the veriest tyro would know that the addition of a small quantity of sodium citrate would correct the trouble.

A source of trouble to lots of us has been the following prescription :

R Phenylis salicylatis .....	3ij.
Ol. santali .....	f3ijss.
M. et ft. caps. xxx.	

When we remember that light calcined magnesia will aid us to make a perfect mass, unless, of course, the prescriber desires us to put it up in sealed capsules, in which case the salol should be first melted, our troubles are soon ended.

Another one of a similar nature follows :

R Tinct. opii deod.....	f3ss.
Tinct. hyoscyami.....	f3ss.
Olei santali .....	f3ss.
Bals. copaibæ.....	℥j.

Misce et fiat caps xij.

Mix the oil of sandal and the copaiba with enough light calcined magnesia to form a mass. Evaporate the tinctures to a soft pilular consistency, and incorporate in the mass.

Here is a very common prescription but a tedious one at times :

R Protargol.....	grsvj
Aque.....	{3ij}

M. et fiat sol.

A very long time is required to effect solution when this substance is added to water, and frequently a sticky, gummy mass results. Hot water is not permissible, as heat decomposes the substance. A few drops of glycerin rubbed up in a mortar with the dry powder, then the water added, insures a perfect solution with no loss of time.

So much for a few prescriptions; now let us say a word or two about suppositories. The writer has made suppositories with every kind of machine and mold, both cold and hot, and desires to go on record as saying that the cheap, little brass or rubber mold is the quickest thing possible, provided the suppository mass is made in this manner: After weighing the medicinal substances, and placing them in a mortar, weigh out enough *grated* cacao butter to make the required number of finished suppositories. Work up the mass well, and add just the least amount of lard, whereupon working in the mortar, the mass becomes tenacious and can be handled easily upon a pill tile. With the aid of a small amount of lycopodium as a dusting powder, roll it out into a cylinder, just as you would a pill mass, and cut into the required number of portions. Now shape each portion with the fingers and force it down into the dusted mould. I have made 25 in ten minutes many a time.

While upon the subject of practical pharmacy and dispensing, two new elixirs might be of interest:

*Elix. Calcii et Sodii Glycerophos. Arom.*

Calcium glycerophosphate.....	256 grs.
Sodium glycerophosphate.....	256 grs.
Syr. vanilla.....	8 fl. ozs.
Alcohol.....	8 fl. ozs.
Fluidextract of kola.....	6 fl. dr.
Phosphoric acid (U. S. P.) a sufficient quantity.	
Distilled water a sufficient quantity to make.....	16 fl. ozs.

Dissolve the glycerophosphates in the distilled water with the aid of the phosphoric acid, then add the syrup and alcohol. Filter through a well-wetted filter or a little talcum.

*Elix. Glycerophos. Comp. Cum Calisaya.*

Calcium glycerophosphate.....	96 grains.
Sodium glycerophosphate.....	64 "
Potassium glycerophosphate.....	32 "
Manganese glycerophosphate.....	16 "
Pepsin (U. S. P.).....	32 "
Glycerin.....	2 fl. ozs.
Phosphoric acid (U. S. P.).....	2 fl. drama.
Water, a sufficient quantity to make.....	8 fl. ozs.
Elix. cinchona (N. F. III).....	8 "

Dissolve the glycerophosphates and the pepsin in the water with the aid of the phosphoric acid, then add the glycerin and elixir of cinchona.

Modification of a few pharmacopœial preparations, viz. :

#### AROMATIC ELIXIR.

Instead of following the pharmacopœial directions, proceed as follows : Add the compound spirit of orange to the talcum, then all the water, and filter. Now add the syrup and alcohol. Several gallons can be made in a short while ; whereas, to filter it after being made pharmacopœially means a two-day job.

#### MISTURA FERRI ET AMMON. ACET.

Omit the tincture of ferric chloride, and add it when dispensing.

#### ZINC OINTMENT.

The writer has had such indifferent success with the ointment of the Pharmacopœia that he has used the following formula for some time :

Zinc oxide .....	200 Gm.
Benzoinated lard.....	180 Gm.
White wax.....	180 Gm.
Oil of peach kernels .....	440 Gm.
	<hr/>
	1000

Rub the zinc oxide with one-fourth the oil of peach kernels until perfectly smooth. Having previously melted the wax and the benzoinated lard, add the remainder of the oil of peach kernels to it and heat until perfectly fluid, then add the mixture to the zinc oxide and oil of peach kernels, and stir until cool.

#### SOAP LINIMENT.

This apparently simple preparation has caused more apprehension in the minds of pharmacists generally, than one might imagine, for the reason that it is almost impossible to make a product which looks twice alike. Ordinarily one would expect to achieve good results from a soap which answers the requirements of the U. S. P., but such is not always the case, and as a result of repeated troubles of this kind, the writer some time ago took it upon himself to modify the U. S. P. formula to the extent of making the soap himself, with remarkably good results. Here is the formula :

Potassium hydroxide .....	10 drams.
Olive oil.....	8 fl. ozs.
Oil of rosemary .....	560 minims.
Camphor .....	6 ozs.
Alcohol .....	90 fl. ozs.
Distilled water, a sufficient quantity to make.....	1 gallon.

Dissolve the potassium hydroxide in 4 ounces of distilled water, then add the olive oil and 4 fluidounces of alcohol. Heat on a water-bath, stirring until thoroughly saponified. When cool add the remaining portion of the alcohol, in which the camphor and oil of rosemary have previously been dissolved and lastly the distilled water. Allow to stand for a day or two and filter.

#### SAFETY BENZIN.

BY OTTO RAUBENHEIMER, PH. G., BROOKLYN, N. Y.

Among the fifty queries issued this year by the Committee on Papers and Queries of the Pennsylvania Pharmaceutical Association, I notice the following one in particular :

No. 23 (odd number). What satisfactory formulas for cleaning-fluids for fabrics, etc., can you suggest which are cheap and not dangerously inflammable?

For the benefit of the Pennsylvania members and others I shall now give you a brief review of my work along this very line.

#### HISTORY OF SAFE BENZIN PREPARATIONS.

In January, 1903, I originated such a preparation and named it "Safety Benzin." It was the result of experiments which I had made when an ordinance was passed in New York City, restricting to the point of practical prohibition the sale of benzin, naphtha and gasoline. The same year, at our Mackinac Island meeting I gave the results of my experiments to the members of the American Pharmaceutical Association in two papers: "Uses of Carbon Tetrachloride," and "Formulæ for Carbon Tetrachloride Cleaning Fluids, or Non-Inflammable Benzin or Safety Benzin." These papers appear in our Proceedings for that year (volume 51) on pages 319 and 426 respectively.

I will quote from my second paper to which I have just referred: "My first successful attempt was the admixture of chloroform. I found that by mixing 2 volumes of chloroform and 1 volume of benzin I got an excellent cleaning fluid for removing stains. This mixture will be safe and will not ignite if a lighted match, for instance, is put to it; in fact, the match will go out if dipped into the liquid. The price of chloroform being 60 cents a pound, or 45 cents by the hundred pounds, owing to a combination of the manufacturers all over the country, I had to abandon the chloroform cleaning fluid. Besides this, chloroform always contains about 1 per cent. alcohol, and alcohol in a cleaning fluid will affect the aniline color of the fabric."

After chloroform I tried carbon tetrachloride, and originated the following formula for "Safety Benzin:—"



Carbon tetrachloride.....	2 volumes.
Benzin .....	1 volume.

By benzin I mean the commercial deodorized benzin, or benzin with a density of about 62° Baumé, as set forth in my paper, "Benzin, Naphtha and Gasoline," published in our Proceedings for 1905 (volume 53), page 427. The name of this 62° B. benzin has lately been changed by the manufacturers, The Standard Oil Company, to "P. & V. M. Naphtha" (painters' and varnish-makers' naphtha), as explained in my paper, "Benzin, Benzine, Benzene, Benzol, Benzole and Benzoline," published in the Chemist and Druggist for July 25, 1908, page 154, and reprinted in The Druggists' Circular for September, Drug Topics for August and various other journals.

This combination will make a safe mixture, which, when poured into a dish (or into my hand, as I demonstrate it), and brought into contact with a lighted match will not ignite; in fact, it will extinguish a lighted match put into it. My "Safety Benzin" is therefore perfectly safe to use around open lights or fire. It must, however, be borne in mind that such a mixture, whilst non-inflammable at any ordinary temperature will burn when heated, because the carbon tetrachloride will evaporate first, when the remaining benzin will ignite. Consequently, as previously set forth, the name, "Non-Inflammable Benzin" in this case is a misnomer, and I have therefore chosen the name "Safety Benzin." In making mixtures of carbon tetrachloride (by the way, "tetra" is a good abbreviation for this long name) and benzin in different proportions it should be remembered that as long as we have any benzin present the mixture will burn. *The more benzin is present the more readily will it burn.*

My two A. Ph. A. papers, and especially my formula, were published or abstracted in nearly all the pharmaceutical and chemical periodicals in this country, as well as in many foreign ones, during 1903 and 1904. The list of these journals is too long to insert in this paper. Even some of our standard books\* have made reference to my work on carbon tetrachloride and safety benzin.

Under the name of "Sicherheits Benzin" a number of German books have published my formula.† And again in 1905 when I endeavored to protect myself by having the name "Safe-T-Benzin" copyrighted, this fact, together with the formula, was published again all over, even in the Farmazeftischeski (Pharmaceutical) Journal, St. Petersburg, for 1906, page 48. Since then my formula is quoted almost every month by some phar-

---

\* The Standard Dispensatory, 1905, page 969; Proc. A. Ph. A., Vol. 51 (1903); *Ibid.*, Vol. 32, p. 631.

† Arends: Pharmaz. Kalender 1905, II, page 34; Riedel's Mentor, 1908, page 203. Riedel's Mentor, 1905, page 122, and 1908, page 215. Hahn-Holfert-Arends: Geheimmittel, 1906, page 388, No. 4431.

maceutical paper, and I am therefore very much surprised that the Pennsylvania pharmacists should not know of it.

But not alone Pennsylvania seems to be in the dark. Away down East in Maine there is a chemist (?) who sends out circulars, in which he says; "Make your own non-inflammable and non-explosive benzine." He sells the secret (?) formula for \$2. I risked the \$2, through a friend, and received the following answer:

"50 per cent. benzine ..... 62 per cent.  
50 per cent. carbon tetrachloride.

mixed and stand for a day. A different degree may be had by using more or less of the latter." I am out \$2, in June, 1908, for this valuable secret (?) which I knew already in January, 1903, and published broadcast. As I gave the members of this Association the benefit of my investigations five years ago, I now give them the benefit of what I learned for my \$2.

To come back to this secret (?) formula: "Benzine 62 per cent." undoubtedly means 62° Baumé equivalent to a specific gravity of 0.729. As percentage in chemistry strictly means percentage by weight, therefore the formula would be

1000 grammes of benzin (sp. gr. 0.729) = 1,372 Cc.  
1000 grammes of  $\text{CCl}_4$  (sp. gr. 1.6) = 625 Cc.

This is more than 2 volumes of benzin to 1 of carbon tetrachloride, or 68.75 per cent. by volume of the former to 31.25 per cent. by volume of the latter, which is a very dangerous mixture indeed!

On the other hand equal volumes of benzin and carbon tetrachloride, which perhaps this chemist (?) intends, although he does not so state, will be a somewhat safer mixture. But even this mixture is by no means non-inflammable, as advertised, as a lighted match held to it causes ignition. Most certainly it should not be named "Non-Inflammable."

My formula on the other hand for the original safety benzin, 2 volumes of carbon tetrachloride to 1 volume of benzin, or 66 and 34 per cent. by volume respectively, is perfectly safe around open lights and fire.

A cheaper preparation may be made by using 60 and 40 per cent. of the two liquids, respectively, or even 55 and 45 per cent. For an absolutely safe preparation, deserving the name "safety benzin," the quantity by volume of carbon tetrachloride must necessarily be in excess. This has been my experience for the past six years.

#### CONCLUSION.

In conclusion I beg to state that if pharmacists in general would join the American Pharmaceutical Association, attend its meetings, read the different papers in its Proceedings and also the excellent Report on the Progress of Pharmacy, which contains abstracts from the best papers the world over, they would be better informed in matters pharmaceutical and

chemical, and they would also be more useful and respected members of the pharmaceutical profession.

The Chair called on Mr. Mittlebach, of Missouri, to read a paper on the ethics of pharmacy, which he presented as follows :

#### A PLEA FOR REAL PHARMACY.

BY WM. MITTELBACH, BOONVILLE, MO.

In this age of mad experimentation, pharmacy is fast becoming a lost art, and a hand-me-down vocation. Ready-made preparations is the goal towards which we are drifting ; and which once reached will mean the quierus of our activities as artisans.

The Pharmacopœia and National Formulary are both being filled up with compound formulas, that will only end in increasing the manufacturer's business, and lessen the pharmacist's opportunity to practice his art. The advocate of compound formulas will at once say that such compound formulas as are contained in our official guide-books, are intended to help the pharmacist. Do they do this? Is it not a fact that the great majority of those in business never think of making even the simplest elixirs, and rely on the manufacturer to make them, thereby educating the physician to specify certain brands? Already our shelves are being filled up with more new proprietaries—those of the Pharmacopœia and the National Formulary.

Is it necessary that we shall have fixed formulas at all, except in a very few instances?

Is it professional to advocate and promulgate such simple things as elix. potass. brom., elix. pepsin, and others of that class? Would'nt it be better for the pharmacist, if his physician friend didn't know of these formulas, and would write out in detail his prescriptions? Wouldn't it be more satisfactory to the physician? He cares very little for the vehicle used in his prescriptions, and often would prefer to change the taste of his medicines. It is the active principle that he is concerned about. The base or vehicle of our elixirs may be pleasant to one patient, and distasteful to another. Let the physician determine what is most acceptable, and trust to the pharmacist to make the combination extemporaneously.

Any prescription—and the great majority of our official compound preparations are nothing more nor less than prescriptions—that can readily be compounded as called for, should not be so advertised as to make it a fixed or proprietary article. The idea of making such a simple mixture as compound acetanilid powder official is wrong. It is certainly not ethical. Even such preparations as the elix. phos. iron quinine and strychnine, and the comp. syrup of hypophosphites could be made up as called for, the physician writing out the prescription, varying the several

ingredients as suits his case. He would then not be troubled with changes of color and deposits of the salts.

It does therefore seem that if we advocated the writing of prescriptions in detail, instead of pushing and building up these ready-made things, the pharmacist would be able to practice his art more in accordance with the teachings of our colleges.

The manufacture of preparations from fixed formulas is bound to go into the hands of the skilled manufacturing firms. They are equipped for it, and have the very best and most skilful manipulators. So let us get back to the old way, and give the pharmacist a chance to practice real pharmacy.

Mr. Payne opened the discussion on this paper, and said it was certainly a paper along the right lines, and one that all pharmacists could endorse and approve; but modern conditions, he thought, were not such as to make it practicable. The tendency of the physician is to abbreviate more and more. He had been in charge of a large hospital for some years, where they had many thousands of prescriptions annually, and he had found this tendency on the part of physicians to abbreviate prescriptions very pronounced. For instance, they would abbreviate Iron, Quinine and Strychnine to "I. Q. S." The physician feels that he can accomplish more, and that he is not so likely to make mistakes when he indicates the formula, as he is when he attempts to write it out full. The tendency is undoubtedly getting more and more toward that system of abbreviation. In addition to that, the average physician carries a lot of "concentration"—as well as concentrated names—with him. He had traveled with physicians recently throughout the country, and he was struck with this tendency. While the attitude of the paper read by Mr. Mittelbach was perfectly correct theoretically, he did not believe the position taken was practicable.

Mr. Hallberg thought there was this pharmaceutical objection to the stand taken by Mr. Mittelbach: First of all, the physician must have elegant and palatable preparations, and it was very difficult to make such preparations in small quantities, such as the ordinary prescription quantity; it would not only be difficult, but would not pay. When it comes to making on a large scale several gallons of elixirs and syrups in about the same length of time it takes to make the ordinary prescription quantity, it may be very readily seen what advantage the manufacturer has in this regard. Take compound syrup of hypophosphites, for instance. To weigh out the many ingredients of this compound and prepare a 100 Cc. preparation would be a tedious matter for the result achieved, whereas it would be relatively an easy matter where prepared in large quantities. Again, the pharmacist cannot get as good looking or as finely flavored preparations when they are prepared in small quantities. That does not

apply to the dosage form of medicines—such as Mr. Wilbert would speak of directly, in a paper he had on that subject; pills, and such things as that. It would apply to the so-called elegant preparations, like elixirs and syrups, and would even apply to a preparation of iron, quinine and strychnine, which is a perfectly legitimate preparation, both pharmaceutically and therapeutically.

Mr. Good said that pharmacists must recognize that a great deal of prescription manipulation has gone away from them as the result of the introduction of ready-made mixtures, and that the National Formulary and the Brooklyn Formulary were originated in order to give the druggists preparations with which to fight these ready-made articles. He said he was sorry to say that the objection suggested to Mr. Mittelbach's attitude was not the only one. As a matter of fact, the "neophyte"—he begged Mr. Hallberg's pardon for appropriating one of his words—did not know how to write a prescription. Medical colleges did not show their graduates how to write prescriptions, and they are as likely as not to recommend the use of proprietary preparations, when they first begin to talk about treatment. We have got to have these legitimate preparations as a part of our fighting material, Mr. Goode said.

Mr. Searby, commenting on Mr. Goode's remarks, said it was really not a part of the medical man's business to know how to make elixirs and how to flavor his medicines and things of that kind; that applies to the pharmacist, and it is his province to prepare things of that kind. He should, therefore, be prepared to prepare them in the most acceptable form to the patient when he comes to take them. People nowadays have come to revolt against nauseous drugs, and pharmacists must meet that condition. If preparations of certain mixtures, such as iron, quinine and strychnine are not made by one formula, but five hundred men in the country have as many different formulæ, the medicine coming from the different stores will have as many different tastes, and the patient and the doctor will never know what he is getting, and naturally they will become suspicious. Mr. Searby thought that Mr. Mittelbach's attitude was not sound, and would be detrimental to the best interests of pharmacy. When it comes to matters of this kind, he said, the doctor should know what to prescribe, and the pharmacist should know in what form to put that medicine and make it as palatable as possible.

Mr. Payne thought it should be a matter of congratulation to the pharmacists of the country that physicians are leaving more and more to them prescription combination—the method by which they shall be compounded—and they should take advantage of this situation.

Mr. Eberle thought that, from the standpoint of economy, it would be inadvisable to adopt such a measure as that recommended by Mr. Mittelbach. It would apply to a great many pharmaceutical preparations, and the time of the pharmacist would be too largely taken up in making these preparations.

Mr. Burge said that in his section of the country they were having trouble in getting their orders for elixir calisaya, iron, quinine and strychnine properly prepared. This could be done formerly, but in sending it out to the trade recently the word comes back that such things are not like they had been accustomed to get. He did not know what preparations the manufacturers were putting up under that name. They had had a good deal of trouble with the wholesale houses, saying that they did not get the same preparation that they had formerly gotten from some other house.

The Chair said there was a misconception of this paper of Mr. Mittelbach's: He did not intend that the doctor should prescribe the compounding of mixtures, but only to indicate what things he wanted put into the mixture, leaving the matter of compounding to the druggist.

Mr. Eliel thought the position taken by Mr. Mittelbach in his paper was really the ideal one, and was undoubtedly based upon Continental practice—Continental Europe; where the physicians indicate what they want in their prescriptions, and what solvents they want used. In this country, however, the physician wants to do things in a hurry; he wants to get through and "get a whack at the next patient." He has not the time to write out in full formulas for the many things he wants to use.

The preparations of the National Formulary and United States Pharmacopœia are intended for uniformity of preparation throughout the country, and were also intended, not to substitute, but to replace the multitude of preparations put upon the market by our friends, the large manufacturing pharmacists. Now is the time when every pharmacist who is entitled to the name of "pharmacist" by reason of being a competent man, can go and make every preparation in the National Formulary, in his own store; and if he has carefully selected material, they should be identical from New York City to San Francisco. Mr. Eliel said, however, that he did not believe the pharmacist could ever force or educate the physicians of this country to the course proposed by Mr. Mittelbach in his paper. It was an ideal condition, but in his judgment none of those present was young enough to live to see the time this condition would prevail in the United States.

The Chair stated that he admitted Mr. Mittelbach's ideas involved here were those of ideal pharmacy, and involved the proposition that medical practitioners should be prepared to prescribe properly. It is well known, however, that a large part of the blame in this connection is due to the medical colleges, which are not as thorough as they should be in their course of training. We must learn to take things as we find them, however, and not expect much of the poor fellow who puts his money into a medical college and does not get the training that he ought to have, in therapeutics and materia medica.

Continuing, Mr. Eliel said that the mixtures that the pharmacist puts

up must be agreeable to the eyesight, and also to the palate, as Mr. Searby had said, for the regular practitioners of medicine are constantly complaining that they must compete with the homeopathic practitioners, who give their medicines in tasteless or very palatable form. So the pharmacists must help the regular practitioner to treat his patients with remedies just as palatable as possible. "And who," said Mr. Eliel, "can be expected to do that more profitably, or better than the pharmacist?—because pharmacy is considered to be a branch of therapeutics."

In Mr. Mittelbach's paper he had pointed out what seemed to the speaker a slight inconsistency in the language: "The manufacture of preparations from fixed formulas is bound to go into the hands of the skilled manufacturing firm. They are equipped for it, and have the very best and most skillful manipulators." If this were true, Mr. Eliel said, what would happen? If we admit that they are better equipped and can turn out better products than the retail pharmacist, what will happen if the doctor prescribes. There will undoubtedly be a few of the large stores thoroughly equipped, as these large manufacturing houses are acknowledged to be, and a majority of the *so-called* druggists we have to contend with, and who cannot be eliminated at once, will not be equipped to do this work, but at the same time will undertake to do it, and a great many mixtures will be sent out improperly compounded, to the detriment of pharmacy as a whole.

Mr. Payne said that, speaking of the ideal condition of pharmacy that might exist only in the far-distant future, in regard to the writing of prescriptions by doctors so they could be compounded by the pharmacists under their direction, that was the condition that actually existed in the South during the Civil War and just after. He well remembered when prescriptions were put up with every detail written out. It seems that conditions are getting further and further from the ideal.

Mr. Mittelbach, replying to the criticisms made on his paper, said that he expected, of course, to have opposition to the paper along these lines. But he wanted to ask this question: Does not the lack of information which the graduate brings with him from the medical college, as to the writing of prescriptions, originate from the very fact that these young doctors can go out and practice their profession, and will not have to bother with writing out the prescription? They can get these things already in the proper shape, and save time by it. If that is a fact, and it will continue that way, it seemed to him that the business of filling prescriptions would resolve itself into a mere economic proposition—to a great extent at least; that it would not take an educated or trained pharmacist to carry on the prescription department. He said this was his idea in his paper, that present conditions would lead to this. Then the study of such prescriptions as Mr. Dunning had brought before this Section would be an unknown quantity, and the teaching of the college of pharmacy would not be of as much use as under the old ideals.

Mr. Mittelbach said his thoughts originated from an experience in a country drug-store. He realized that in the cities, where time was more valuable, the pharmacist would find it hard to train his clerks to think out propositions in prescription work—to study this problem of prescriptions; but in the majority of stores in the smaller towns he thought there would be plenty of time to do this, and in his own experience with physicians, he had taken them away from these advertised preparations, and shown them how they could write their own prescriptions and make a palatable preparation, without prescribing these high-priced things. In that way he had been able to some extent to keep his clerks busy in learning the art of compounding these complex prescriptions.

Mr. Goode here moved that the paper ready by Mr. Mittelbach take the usual course, and this motion was seconded by Mr. Hallberg and carried.

On motion of Mr. Hallberg, a paper by John T. Harbold, of Philadelphia, on "The Opportunity of the Hospital Pharmacist," was read by title and referred to take the usual course. The full text of said paper here follows:

THE OPPORTUNITY OF THE HOSPITAL PHARMACIST IN ADVANCING  
THE UNITED STATES PHARMACOPEIA AND NATIONAL  
FORMULARY PROPAGANDA.

BY JNO. T. HARBOLD, P. D., PENNSYLVANIA HOSPITAL, PHILA., PA.

"As a tree is bent so it will grow" is a maxim which is capable of application to the animal as well as the vegetable kingdom, and a bend given to the human propensities in the formative period of life is as readily retained in one instance as the other.

We use this maxim as an illustration of our simple theory that the natural inclination of the medical practitioner in the selection and prescribing of drugs is, in a great measure, determined by the nature of his instruction in materia medica, therapeutics and medicine, and the attitude which his professors and instructors have adopted in relation to this branch of his art. The reason for this is obvious. It is within the observation of us all.

The mind in early student life is most impressionable; the imitative and receptive faculties are at their zenith, and the impress made, not merely by the instruction, but by the general demeanor of the teacher, is often indelibly fixed in the characters of the men to whom the tuition is being given. This is an abstract, fundamental principle that is recognized as soon as it is uttered. It is this principle which generally controls in the teaching staff of a college, and the success of a teaching institution is largely dependent on the extent to which this principle is consulted in the appointment of those whose influence on the student body most nearly approximates the standard of an ideal educator, and whose proclivities and prejudices are worthy of imitation and support. But it is no uncommon



thing to find in some of the medical schools and colleges of the present-day professors whose teaching is modeled entirely upon their own theories, and who are intolerant of the discoveries of their contemporaries, or the results of the experience of their predecessors, when they are at variance with the conclusion which they themselves wish to attain. This attribute in some cases rises no higher than stubbornness, in others it resembles eccentricity, but in nearly all cases it is condoned, if not actually approved, since it denotes originality—that enviable characteristic which even college professors do not always possess. We make these observations with the utmost respect for the gentlemen who help so much to fashion the scientific side of the members of this distinguished profession, and we refer to conditions in which they figure simply to call attention to a fact which concerns the pharmaceutical profession as well.

The lecturer in materia medica, therapeutics or medicine frequently prides himself upon the originality of his own instruction. In the desire for student popularity, he exerts every effort to make his subject attractive, and he imagines that the substitution of a trite, snappy terminology (even though compiled from the literature of proprietary concerns) for the official nomenclature will achieve the desired result. He will not be confined to the U. S. P. He fancies that it savors of the commonplace if he recommends the strict use of the official preparations, and that he is hampered in the discretion of his office if he cannot suggest the administration of well-known drugs under smart proprietary names. So far he is promoting his own interests, but he forgets that the man before whom he is appearing will unconsciously assume his attitude of indifference in following the standard text-books (U. S. P. and N. F.); that they will imitate his laxity, and that they will exhibit no more discrimination than he himself between proprietary remedies at exorbitant prices, and official drugs of equal efficacy, and in many cases of identical chemical composition, at much lower cost. The result is quite natural. The young graduate in medicine, when he emerges into practice, will follow the whim of his mentor. He neglects to consult the Pharmacopœia and National Formulary; he will carry into execution the indiscriminate suggestions picked up in his classes, and the patient for whom he is prescribing, and the pharmacist who supplies the remedy will suffer thereby—the latter will have the trouble of hunting up fancy patent nostrums, and the former will be put to extra expense.

This, we contend, is the condition in some of the medical schools of the highest standing, and being beyond our jurisdiction, and not readily amenable to our wishes on such matters, these schools must be left to themselves with the hope that the evolutionary process through which teaching institutions will occasionally pass will yet bring their systems to, at least, a reasonable adherence to the old and reliable standards—the United States Pharmacopœia and National Formulary. There is, however, a stage in the

professional training of the majority of the present-day physicians to which we can turn our attention, and through which, if tactful, we can accomplish much towards harmonizing the professions. We refer to the post-graduate hospital course taken, as we have said, by the majority of the physicians graduating in our time.

By the average interne in a hospital, the position is regarded as entirely educational. His work and duties are but a continuation of his pre-graduate labors. He is, of course, entitled to a more intimate acquaintance with the prerogatives of the practicing physician than in his student days, but he takes up hospital work in order to perfect himself in his art. It is here that the hospital pharmacist can, and should, play an important part. The patient's treatment as directed by the visiting physician or surgeon, is transcribed in appropriate form by the interne who often uses in this work the proprietary nomenclature acquired in his student days with the acquiescence of his chief, who has possibly overlooked or was ignorant of the existence of a drug with the same chemical composition in the U. S. P., just as efficacious and much more economical than the proprietary preparation with the fancy title. It is the duty of the pharmacist here to point out to the interne, or to have it brought to the knowledge of his chief, that such prescriptions are needlessly expensive, and that a moment's reference to the U. S. P. or N. F. would furnish him with one or more remedies just as effective as the trade preparation, and possessing the advantage at once of being cheaper, and of ingredients of the nature of which he knows to a certainty, and of the effects of which he can find the most definite information.

With the hospital interne the hospital pharmacist is naturally in closer touch than any of his brethren outside, and being in charge of the drug supply of the institution, the pharmacist has a reasonable right to expect that his view on matters pharmaceutical should prove acceptable to the resident medical staff, and that his suggestions for the elimination or addition of such pharmaceutical terms as have been passed upon by the proper authorities, should receive from the interne the consideration they merit and deserve. If the pharmacist has carefully thought out the proposed changes in the mode of prescription writing, and can show conclusively that the adoption of the revised system will make for economy and regularity, he will seldom experience disappointment in the reception his ideas are accorded by intelligent men. By men of captious temperament his aggressiveness may be temporarily checked, and his motives may frequently be subjected to criticism, but if he casts the bread of an honest purpose on the waters he shall find it even after many days. To his critics in general he can reply that his action is prompted solely by a desire to economize for the institution, and to secure complete uniformity in medication, and the absence of selfish, pecuniary motives on his part must attest to the integrity and uprightness of his plan.

We have been active in the propaganda work for over four years in connection with hospital dispensing, and the results have been extremely gratifying. The oft-repeated statement that physicians do not want to become posted on these various preparations, and receive suggestions from the pharmacist is erroneous. The experience of the writer leads him to believe that the physician is quite willing to confine his prescribing to the U. S. P. preparations as nearly as possible, and when his attention is called to the fact that he is writing for U. S. P. drugs under fancy trade names he is usually thankful for the information, and alters the prescription writing accordingly.

It is in this way, we believe, that the hospital pharmacist has great opportunities for rendering much valuable service to both professions. By a timely, judicious suggestion he can start a new train of thought in the mind of the young physician. He can turn the latter's attention to the advantage of a uniform system of prescribing, and, if opportune, he may be able to check and discourage the random use of vague and uncertain compounds which lead to empiricism on the one hand, and irregularity and dissatisfaction on the other.

In conclusion, let us express the belief in the ultimate harmonious co-operation of the medical and pharmaceutical professions, and we would not willingly mar this harmony by sounding a discordant note. We must not be taken as alleging that all physicians favor the use of patent medicines, or that in all cases it is easier for the pharmacist to compound the prescription than to hand down the ready-made article from his shelves, but we believe there are many hospital internes who have not learned the formula of the proprietary drugs they order, nor do they know that a little insight on their part would save considerable money to a needy institution, and later in life save drug bills to their patients, whose financial interests they should conserve as carefully as their health.

The Chairman stated that, as to Mr. Harbold's paper, he had found in the *Pacific Pharmacist*, for August, that a paper was read at the meeting of the California Association, on May 20th of this year, on a similar subject, but he knew Mr. Harbold had this idea in mind long before this paper was read in California, and hence he had no hint from that paper that was read out there in May as to the work he had done here.

Mr. Searby said the paper to which the Chairman had referred was read by a young and talented and beautiful young lady, and that she was not in the habit of giving hints to gentlemen, either. She had no need to do anything of that kind. He said the paper she had read was a very able one, and that she had practiced in a hospital and could do anything that was to be done in hospital practice, and had been very successful in doing the very things she had referred to in this paper.

The Chair endorsed Mr. Harbold's paper as being a good one, and suggested that both papers be read by pharmacists.

On motion of Mr. Asher, a paper by Mr. Niece, of New York City, on the "Deterioration of Solutions," was read by title and ordered to take the usual course. The full text of said paper here follows :

#### SOME CHEMICAL REASONS WHY SOLUTIONS DETERIORATE.

BY FREDERIC E. NIECE.

One of the greatest annoyances that the pharmacist has to contend with is the inevitable spoiling of various substances in aqueous menstrua. On numerous occasions, no doubt, this matter has been patent to many of us. The annoyance of finding the condition of certain solutions contrary to our expectations is often a more serious matter at the moment than the loss of the actual cost of the preparation.

These annoyances, however few or many, are not as a general thing the direct results of carelessness in the preparation of solutions but more particularly in their keeping. They seem to spoil in the very face of every precaution, and do so under conditions that appear to be totally invisible both to the eye and the mind. In one sense it is well to suppose that these changes are brought about by the existence of chemical energy working within the solution or coming from without. Aside from this we have other forces which seem to be working to the same end, which constitutes a large group of microscopic forms that are collectively known as micro-organisms.

These low forms of plant life are constantly on the alert—under favorable conditions—to destroy many of our products, which from one point of view is unpleasant when not desired. Since this is a subject of considerable magnitude, space will only allow, at this time, but a passing remark, for the primary object of this paper is to call attention to those conditions resulting from physical or chemical forces. Therefore, these few remarks will endeavor to convey a few selected ideas dealing directly with such common solutions that have been known to undergo peculiar changes and thereby suffer alteration or decomposition to a marked degree ; an investigated theory as to the probable factors causing the changes with a few suggested means for overcoming the evil ; forestalling the change or otherwise restoring the spoiled product, which in theory and in practice, in the hands of some, have served a well-intended purpose. The reason for restricting this paper to the narrow limits of chemical influences, and thus totally ignoring such an important branch as that of bacteriology, will become readily apparent when the reason is made known that, while both are generally associated in conditions of this kind, they cannot be properly dealt with in such a short treatise as this. Consequently, only the superficial chemistry involved in the spoiling of a few solutions, with a view of bringing notice as to how and to what extent the elements influence the deterioration of solutions, will be considered, thus refreshing the memory with ideas not entirely new but deemed of sufficient import for the extreme purpose of averting these petty annoyances.

It is well understood that light, heat and exposure go a great way in spoiling solutions. This is a fact undeniable, but since we have no tangible control over the elements it behooves us to either alter, modify or otherwise eliminate these forces, as the case may be, to as low or high a degree as possible; but should this precaution by some reason be neglected and we find a spoiled solution in our stock, our only course then is to either discard the preparation entirely or, if possible, restore it to as near its original condition as is practicable and yet not change it physically or otherwise add any substance capable of producing serious results. In the case of laboratory solutions this, in many instances, is perfectly permissible but sometimes impracticable, while with pharmaceutical solutions restoring methods have a wider field of adoption. This is of course dependent generally upon the dire need of the preparation for the moment or its basic cost.

One source of unlimited trouble is the keeping of potassium iodide solutions in an acceptable state. This solution liberates iodine in a very short time, thereby producing a suspicious-looking preparation, making incompatibilities possible and oft-times producing unpleasant physical symptoms. A reason is extant for this condition which is attributed directly to exposure or atmospheric interferences, in which the combined action of oxygen and carbonic acid in the atmosphere in conjunction with light and heat tends to liberate free iodine, and this in return forms the troublesome iodate. For this change oxygen and carbonic acid are dependent upon each other. This may be retarded to a considerable degree by using fresh distilled water, keeping solutions in a cool, dark place, well protected from light and exposure, with the addition of about 0.2 per cent. of pure sodium thiosulphate. Water distilled from copper vessels is also credited with the same power. This causes the liberation of iodine by virtue of the presence of copper oxide, which is found to pass over in traces during distillation. To overcome this difficulty use distilled water known to be free from this source of supply.

Ammonium iodide and its solutions also liberate iodine in time. This is a much more weakly-combined salt than the former and therefore prone to quicker decomposition. The same cause for alteration may be ascribed to this one as the above, but then light and heat will act in the same direction without the assistance of oxygen and carbonic acid. This condition can be greatly lessened by suspending a cube of ammonium carbonate in the vessel containing the salt, and by adding a few drops of a diluted solution of ammonia water to a solution of the same. The amount should be just in excess of that required to discharge the yellowish color.

Chloroform water readily decomposes by the agency of light, heat and exposure. By exposure we mean the constant opening of the containers during use. Several by-products of an acid nature are the results in which odors similar to hydrogen phosphide and decomposed marine algae

have been observed. By the permissible addition of four per cent. of alcohol a solution is produced that will keep indefinitely.

Chloroformic solutions of iodoform are not as stable as alcoholic ones, because chloroform in some manner acts as a carrier of oxygen which with the iodoform itself acts as an energetic liberant and thus frees the iodine from its own compound through the influences of direct sunlight. Chloroform itself decomposes appreciably in the presence of iodoform into several by-products which tend to act directly on the iodine. Chloroform for this purpose should be strictly U. S. P., and recently distilled if possible, and the finished product kept in sealed containers in a cool, dark place.

Ferrous sulphate solutions are readily oxidized and thus altered by the action of the oxygen in the atmosphere and light due to exposure.

In fact, water alone as a carrier of oxygen will produce the same results. I have kept a solution of the above salt indefinitely by using recently-boiled distilled water with just sufficient sulphuric acid added to produce a decided acid reaction with litmus.

Solutions of sodium thiosulphate easily spoil by giving up sulphur by the action of the elements and their contained constituents. A drop or two of carbon disulphide, or a few drops of carbon tetrachloride to the solution seems to prevent this change.

Silver nitrate solutions become dark on keeping on account of the action of actinic rays and the free alkali so often found in bottles. The black oxide of silver is formed. It may be prevented from forming to an unlimited point by first washing out bottles with a strong solution of nitric acid and stored away in a dark, cool place in orange-red bottles.

Solutions of lead bromide and many other soluble salts of lead are decomposed by the action of light into darker oxy-compounds. To materially avoid this, keep the solutions well corked in dark places.

Dilute nitro-hydrochloric acid readily decomposes by losing chloro-nitrous acid. Solutions of this acid should be freshly made and stored in the ice box.

Bitter almond water and dilute solutions of hydrocyanic acid are both liable to decomposition due to oxygen in view of exposure, light and temperature. To retard this process, add about two drops of a 25 per cent. solution of hydrochloric acid in water to every pint of the above solution.

Chlorine water undergoes rapid changes on account of the contact with oxygen from the air, light and heat. Hydrochloric acid is no doubt formed.

The life of this water may be greatly prolonged by placing some washed litharge in each bottle containing the water. This water should be kept in four-ounce amber bottles, well filled, kept cool and protected from direct light.

Another solution that so often changes, and is an expensive one is the

solution of ammonium molybdate. This deposits molybdic acid, due to the loss of portions of the ammonia base caused by temperature and light. To obviate this, prepare two solutions, one of the salt itself and one of a 30 per cent. nitric acid, which use in proportions of one part of the former to three parts of the latter. This is calculated on a basis of 15 per cent. solution of the molybdate.

Solutions of sodium hypobromite if kept in amber or yellow bottles become deeper in color and weaker in strength, thereby indicating a supposed decomposition. This is claimed to be due to the dissolution of the alkaline manganates freed from the manganese in the glass. To prevent this use green, blue or flint glass bottles or paraffin bottles with 10 per cent. potassium bromide added.

Volumetric solutions of the strong alkalies such as sodium and potassium hydroxides deteriorate in proportion to their age by the action of the alkalies on the glass of the bottle, thus altering slightly their titer.

An observed precipitate found in one of my bottles containing a  $\frac{N}{2}$  NaOH solution, which bore the date 1-17-'02, on examination proved to be a mixture of pure silica and ferric hydroxide. Strange to state the titer of this solution as compared with  $\frac{N}{2}$  H<sub>2</sub>SO<sub>4</sub>, was within a half of a Cc. of checking up.

These slight changes may be thwarted, however, by using paraffin-coated bottles.

Solutions of eserine salts by the action of light and oxygen and the alkali present in glass bottles soon develop a red color, a substance not thoroughly understood. By using sterilized water, making up small quantities at a time, and coating the inner parts of the containers with paraffin wax, and pouring a small layer of previously washed and boiled paraffin oil over the surface of the solution, a condition is produced which will prevent this coloration to an almost unlimited time. Good glass-stoppered bottles should be provided, and the same with the solutions stored in dark places. To obtain the solution from beneath the paraffin layer a pipette must be resorted to, and since this solution is generally used for eye lesions the oil does not interfere with its use for this purpose in the least.

Solutions of lead acetate on exposure form heavy white precipitates of lead carbonate due to the absorbed carbon dioxide furnished by the air.

Traces of free acetic acid restrain the action of carbon dioxide.

Solutions of ammonium phosphates produce a precipitate of acid ammonium phosphate primarily caused by the escape of free ammonia due to temperature. To avert this trouble add small amounts of free ammonia by using stronger water of ammonia.

Solutions of sodium nitro-prusside decompose into cyanic compounds of a bluish color. This is occasioned by impure water containing traces of iron in conjunction with improper exposure to light and atmospheric disturbances, which of themselves are due to the presence of actinism and

oxygen. If solutions are made faintly alkaline with sodium hydroxide and kept well corked in dark places this change rarely takes place.

The precipitate so often found in solutions of aluminum acetate is induced by the presence of magnesium carbonate in the calcium carbonate. To eliminate this annoyance use a carbonate that is known to be free from magnesium.

Lotio nigra deteriorates in the process of constant use and unclean vessels by the alteration of its formed "black oxide." The addition of 5 per cent. glycerin, or a 10 per cent. mucilage of tragacanth with 5 per cent. alcohol combined will, by this means, prevent this change and thus aid to keep the oxide in suspension.

A paper by J. Leon Lascoff on "The Professional and Commercial Pharmacist" was, on motion of Mr. Mayo, read by title and ordered to take the usual course. The text of said paper here follows:

#### THE PROFESSIONAL AND COMMERCIAL PHARMACIST.

BY J. LEON LASCOFF.

As a member of the Allied Pharmaceutical Associations, and while visiting many stores on the propaganda work for the U. S. P. and N. F. preparations, I observed many things. There were a large number of pharmacists who appreciated our efforts in this good work, but, to my great sorrow, a number were not even in favor of it. They were not anxious to have any more prescriptions, either for N. F. preparations or others, their aim in business being to "make money"—it made no difference on what. One of our fellow pharmacists on whom I called had a fine window display of souvenir postal cards, and when I called his attention to the fact that the aim of the propaganda committee was to increase the prescription trade, he informed me that this was not his desire. He considered himself better off by selling the souvenir cards than by putting up prescriptions. Not a great distance from this store was another one with a display of shoe polish. A young lady was standing in the window exhibiting the goods and showing its merits. This was not a large store, but it was crowded with people buying shoe polish. It is hardly possible that there were any customers buying drugs, or having prescriptions dispensed. It made the impression of a shoe store rather than a drug store. In other sections of the city I noticed displays of cameras and photographic art supplies, hair insoles, etc. All these things are entirely side lines of our profession.

It is certain that no drug store can exist from prescriptions only. We must have other articles to help with the expenses of heavy rents, gas, etc. We cannot all be strictly ethical pharmacists, but we need not make a specialty of these articles, which are entirely out of our line of business, and we should give the preference to our prescription department and the



scientific part of our profession. Take example from other professional men, such as physicians, lawyers, electrical or civil engineers, pedagogues, dentists, etc. A physician, after graduating from college, goes to a hospital for a few years to obtain more knowledge, and then, if financial circumstances allow him, he generally goes to Europe to search for more knowledge at various clinics. What would we think of a physician to-day if, besides his practice of medicine, he would engage in something out of his calling? The same can be applied to all other professions.

The aim and object of the American Pharmaceutical Association and other associations is that pharmacy should be recognized as a profession. In the June number of the "Voice of the Retail Druggist," edited by the A. D. S., appears the following: "The A. D. S. is not asking its members to give up other organizations, which are mainly of an ethical nature, for example, the A. Ph. A. is a professional organization in which many pharmacists take pride. It is well for them to belong to it because it stimulates the professional spirit."

If a man establishes a prescription trade, and with it a good name and reputation, it will make no difference in what part of the city he is located. His competitor cannot take that good name and reputation away. People will buy merchandise where they can get it cheapest, but they buy drugs where they can get the best, and take their prescriptions to the man in whose reliability they place the most confidence.

To establish such a name and reputation, we pharmacists must pay special attention to the prescription department. We must keep our stores clean and neat, buy the best drugs obtainable on the market, dispense everything in as nice a manner as possible, and give to all our prompt and best attention. We must employ the best help, which will be found to be the cheapest in the end. In our absence we must leave the store in charge of a representative and reliable person, so that the public will retain their confidence. We must also advertise our prescription department among the physicians in our neighborhood, and keep our stock of bottles well filled—peppermint water, spirit of camphor, turpentine, lime water, etc., are of no expense whatsoever. A man whose mind is concentrated on petty merchandise cannot give the prescription department the attention necessary to make it a success.

After we have established our name and reputation, and our prescription trade has increased, we will obtain the patronage of the public from quite long distances. One customer will tell another. We will then be able to charge pretty fair prices. In sickness of serious character the public does not look for the cheapest. They look for the best and most reliable. What confidence can we expect from the physician and the public when they see stores which look like a shoe, stationery or dry-goods store? The former will not trust us with his prescriptions to be compounded, but will write ready-made preparations or will be apt to dispense

them himself. How often do we get prescriptions calling for ready-made preparations? Isn't there more profit in a prescription dispensed by you personally than in the original bottle of some proprietary article? Did we receive a college education to become merchants? There is no doubt but that there is a good deal of profit in specialties, but there is more profit in prescriptions and drugs if you buy right. Let us unite in common effort and be in friendly relations with each other. Do not let us give up the battle to raise the standard of our profession. Honesty, energy and good scientific work make a combination hard to beat.

I do not wish through the foregoing remarks to be misunderstood. The term "commercialism" has been used in the broadest sense and is not intended to mean that pharmacy should not be accompanied with a certain amount of general trading. As I have previously stated, we could not make a living from drugs alone. But what I intend to emphasize is the fact that the various specialties, over-advertised, and outlandish industries, should be entirely eradicated. Make drugs your specialty, and, as an adjunct to your store trade, handle all kinds of reasonable and rational merchandise. A pharmacist who properly invests his capital in staple, reliable, every-day useful goods, has always a good asset on hand, and could always, under strained circumstances, reconvert the same into cash.

In reference to cutting prices, I may add that you certainly do not receive any benefit; therefore you injure your pocket, and the overzealous public obtains the benefit, financially, but does not leave your store with any higher or more exalted opinion of you as dispenser. You know from experience that the regular cut-price store is never overburdened with prescription filling. The place is known as a cheap store, which insignia is certainly not a flattering one to you or any great compliment to our profession. Let us try to be as professional in our commercialism as is possible, and as little commercial in our professionalism as comes within the scope of our time-honored calling.

The following paper by A. S. Coody, on "The Pharmacist and Physician," was also read by title and referred to:

#### PHARMACIST AND PHYSICIAN.

BY A. S. COODY, OSYKA, MISS.

The practice of true pharmacy and the following-out of all the teachings of the profession presupposes the existence and work of the physician. Without his co-operation the profession of pharmacy as a separate and distinct science must of necessity cease to exist.

On the other hand, the profession of medicine as a distinct and separate science would be impossible of existence upon its present high plane of development without pharmacy to aid, to assist and to point out the shining way in some of her darkest hours.

Then, since each is in a large measure dependent upon the other, it is of much importance that the members of the two professions be as cordial in their relations as possible—each sometimes forgetting self and working wholly for the common good.

That their relations are not always of a very pleasant character is equally evident. Believing that all should endeavor to better these relations, the writer has been prompted to write this paper and suggest that each member of the A. Ph. A. become an emissary of peace.

Each profession has duties to perform, and these should be done cheerfully; each has privileges, and these should not be abused; each has certain well-defined limits to its field of action, and each should be careful not to go beyond these limits. Of course, in two professions thus intimately blended it is sometimes difficult to distinguish where pharmacy ends and medicine begins, but if each is thoroughly imbued with a desire to do right and will be careful they will never trespass upon the province of the other enough to cause friction.

It is not my intention to discuss this question from an academic point of view, but rather to speak of the practical relation of the physician and pharmacist in the retail drug store of to-day.

As I have already stated, the relations of these sister professions should be cordial and confidential, not spiteful and distrustful. And *all* that is needed to bring about this condition is for the members of each profession to mind strictly and mind well its own business and let the other fellow's alone—a big all, I admit.

The pharmacist is to blame, in the first instance for neglect, by not being alive to his own duties and responsibilities—and possibilities. Upon being admitted to the ranks of the profession, the pharmacist at once becomes a part of pharmacy, and it is his sacred duty to assume its burdens, to fight its battles, and to give to its betterment and upbuilding all the qualities he has to give, as much as it is his privilege to participate in its profits or share its glory. The man who fails to do these things is a failure in the beginning as a pharmacist, and at heart is a “spoiler” and a disgrace to the profession.

In return for the special skill and learning we, as pharmacists, are supposed to possess, we have been given the exclusive right to sell and dispense drugs, and are usually given a big say as to what rules and regulations shall be prescribed to govern the profession. Ability is ever the mark of commission, and a privilege carries with it always a duty; therefore, we owe both physician and public something in return for the favors bestowed upon us. We should be faithful to every trust reposed in us, discharge every duty honestly and ably, keeping before us always the fact that as members of a profession each of our acts reflects credit or discredit upon our fellow-members as well as upon ourselves.

If we but live up to our duties fully we not only will place our profession

upon a higher plane, but will gain a stronger hold upon the affections of our fellow-man, command the confidence and friendship of all worthy disciples of Aesculapius, and reap a greater harvest of golden coin.

As a mere citizen and a gentleman we should treat our physicians honestly in every detail, and as pharmacists we should add to this professional courtesy. In return we have a right to and should demand the same treatment.

I find physicians average human beings, and as a rule they readily respond to courteous treatment, but as in everything there are exceptions. These exceptions I treat with the contempt they deserve, and let them go their way, avoiding as much as possible any dealings with them. Personally I try to make my medical customers my personal as well as professional friends, but in all cases I put the professional part before the personal.

Doctors have faults in common with our humanity, and common justice demands that we be considerate, and lend our assistance when possible to do so. If your doctor is in doubt as to what preparation to use, which will be more pleasant, be ready with kindly suggestions and show yourself interested in the patient, and able to pass judgment upon the compounding of medicines, a person of attainment and positive practical knowledge, ready to use your knowledge in its proper place, and not as a competitor. Let him know that your knowledge and your skill and your energies, and all the remedies under your control are for the use and benefit of humanity, and that if he chooses to play his part correctly, you are willing that he should be the agent through which they are to be applied.

A frequent cause of friction is the manner in which prescriptions are treated. For instance, a patient comes in with a R. The R clerk should not only refrain from any criticism, even though richly deserved, but should not give notice of an error by a smile or any expression liable to inspire a lack of confidence in the writer. The patient has shown his confidence in the physician by consulting him, and the pharmacist should never attempt to lessen this.

Very often we haven't a particular drug in stock and cannot fill the prescription as written. To hand it back and say we haven't the medicine in stock is simple enough, but oftener we give a long explanation to the effect that the drug is new, very rare, untried, or else obsolete, out of date, etc., sending our customer away with a bad impression of both ourselves and his physician.

In the matter of substitution, flagrant violations of ethical practice are of daily occurrence in some drug stores—only some. This I hold is dishonest, regardless of the merits of the two preparations or drugs. Right demands that we put into a prescription what it calls for or refuse to fill it. Even where we know the substitute is better, will answer requirements better and give better satisfaction to all parties, fairness to prescriber and

manufacturer tells us to fill it as written. When a proprietary remedy is prescribed the same rule applies. It certainly is not our place to use a preparation of known formula. Put in what is prescribed and let the responsibility rest upon the prescriber.

I admit that sometimes we are called upon to dispense medicines upon prescriptions that bring a guilty feeling to the heart, but my own rule has been to go ahead and then frankly and kindly call the prescriber's attention to the matter. I am not boasting, but nearly always I have succeeded in having the meritorious article prescribed in future.

The proprietary and "own line" question frequently causes trouble, and both pharmacist and physician are to blame—the pharmacist when he "pushes" patent medicines, and the physician when he prescribes them. Of the two, the physician is far the more culpable, for he cannot plead in his defense self-interest. He gets no more for his work, deceives his patient, and endorses something of whose composition he is as fully aware as he is of the structure of the moon. Later, when he finds his patient using these same remedies he is inclined to get angry at some one else, and the druggist is about the most convenient person upon whom to vent his spleen, forgetting that his own prescription was the very highest endorsement, and the patient is only paying him a compliment in using a remedy whose only claim to merit is his own official sanction.

Again, a few physicians err in writing testimonials for nostrums, with a list of testimonials signed by "M. D.'s." Almost anything will find a ready sale. Of course this fault cannot be charged against the medical profession in general, but they (physicians) could use their influence to prevent such endorsements.

For the druggist who "pushes" patent medicines and makes of his store an advertising medium for their sale there is no reasonable excuse, and I have only contempt and commiseration.

I think the greatest reason for druggists getting into the "pushing" habit is allowing oneself to become overstocked. For the druggist with a stock of some patent medicine that isn't selling very fast, the temptation to sell at any cost is very great, especially about pay-day. For this, prevention is the only cure. Don't allow some smooth-talking salesman to sell you a quantity of something not staple. Discount and long terms do not count when the thing doesn't sell itself. The first cost may be cheap, but when you bear the expense of selling when there is no demand you lose in the end. My rule on the proprietary question is to buy what is called for by my customers, and to sell on demand only. To this I do not think any sensible physician can object.

Experience has taught me a lesson in regard to another matter—the stocking of drugs upon a physician's request. The ubiquitous specialty man comes around and convinces your doctor that a certain compound is an excellent combination. You are asked to put it in stock, and that usu-

ally ends the matter unless you dispose of it through your own efforts, possibly in the form of a counter prescription.

A doctor friend of mine once asked me to stock a preparation especially recommended for whooping-cough, saying, "I want to prescribe it," and even "O. K'd" the salesman's order. I bought some of it, and have never had a prescription for it. After keeping it ten months, I was asked by a customer to give her something for whooping-cough. I prescribed some of the prescription (my first counter B), putting the name and directions on the bottle. The results in the whooping-cough case were satisfactory, but the doctor and I have never been friends since. I then decided it wasn't best to always buy on a promise to prescribe.

Now on another question I want to say (Dr. McCormack to the contrary) that a physician has no right whatever to object to a druggist selling soda water, cigars or sundries. Certainly no more than the druggist has to censure the physician for investing his money in stocks, bonds, real estate or similar things. Each has a right to demand what the other shall be in a professional way, and not what he is otherwise.

The much talked about and written about "counter-prescribing" is not a local issue. I do not know of an instance where this has caused any discord between the medical and pharmaceutical professions, so my whole knowledge is theoretical and hearsay, and I shall leave its discussion to those with a practical interest in the matter.

We are everywhere informed that this is a commercial age, and I guess it is, if an inordinate, over-weening, persistent, and unscrupulous desire to obtain possession of the "Almighty Dollar" is commercialism. We find men in every walk of life ready to stake their all—honor, friends and character upon the altar of gain. Amid such scenes it is not strange that this spirit should enter into the retail drug-store, and become the dominant factor in the practice of some of the inmates. We see these little fellows quite often, and their sense of importance is only equaled by their ignorance and disregard of the real situation. Their sole purpose is to make money, regardless of consequences. There are men to-day who call themselves druggists, who would destroy the very art of pharmacy if it would only enable them to make money.

Understand now I have no word of censure for a druggist who makes money from the practice of his profession, neither do I object to them carrying a line of sundries. Indeed I think pharmacy realizes too little for its legitimate services, and profits along this line should be increased. But for the man who disgraces the calling by dealing in soda water, cigars, pictures, jewelry, sundries, etc., under the sign "drug store," with a prescription case as a side line and a decoy, I have not words to express my contempt, and I submit that the decent druggists should unite in kicking him out of the profession.

In conclusion I want to emphasize the importance of harmony between

the medical and pharmaceutical professions, and between pharmacists themselves. I would especially urge that every druggist do his utmost to bring about this condition, and in so doing we will have taken a long step toward that day of idealism, when a grateful and loving public will place upon the brow of pharmacy the crown of altruistic success and proclaim the truth, that with all her faults she is worthy to live.

A paper left over from the morning session, entitled "Some Dosage Forms of Medicine," by M. I. Wilbert, was, on motion of Mr. Mayo, read by the Secretary of the Section. The text of the paper here follows :

#### SOME DOSAGE FORMS OF MEDICINES.

BY M. I. WILBERT,

Apothecary of the German Hospital, Philadelphia.

With the continued increase of specialization, in all branches of medical science, there should be an excellent opportunity for the dispensing pharmacist to develop as an authority on available methods of administering medicines and the forms of medicine best suited to any one mode of administration.

It is well known that the effect of a drug or remedy is largely determined by the method of its administration, and this fact alone would suggest the need for expert knowledge, on the part of the dispenser, if he is to develop as an advisor or technical assistant to the medical practitioner.

It is not my purpose to outline for you a course of study, or even to give you a detailed description of the several methods that are available, for the administration of medicines. For the purpose immediately before us it will suffice if I can but suggest to you the possibilities for interesting study that present themselves in this direction, and to call your attention to the need of securing, for future pharmacists, some adequate provision for systematic training in such branches as physiology and experimental pharmacology.

Broadly speaking, the action of medicines may be defined as being either local or general.

For their local action drugs are applied directly to the skin, to the mucous membrane of the respiratory, alimentary or genito-urinary tracts, or to the conjunctiva and cornea. The application may be by simple contact, by inunction, by injection, or by instillation.

The general action of drugs is elicited after their absorption, into the circulatory system, from the stomach or some other portion of the alimentary tract, through the mucous membrane, through the unbroken skin, from the subcutaneous tissue or by injection directly into a vein.

The mode of administration preferably used, is ingestion by mouth, though inunction or application to the skin and mucous membrane, hypodermatic injection, rectal injection and intravenous injection, are also employed to a considerable extent.

With hypodermatic and intravenous injections the altogether too much neglected problem of sterilization plays an important part, and constitutes one of the many reasons for a broadening of the present altogether too restricted curriculum in pharmaceutical schools.

It is generally well known that the rate of absorption from the alimentary tract varies greatly with different drugs, and also with the form in which any given drug is administered. Other factors being equal medicines are more rapidly absorbed when they are in solution, and their absorption is correspondingly retarded when, being administered in a solid form, they are accompanied by inert or insoluble materials.

The forms in which medicinal substances can be administered may be practically defined as solutions, mixtures, emulsions, powders, pills, capsules, suppositories, ointments and plasters. In this connection it should be pointed out that this classification is practical, not pharmaceutical, and that there are no hard and fast differences that will facilitate proper classification.

From a practical point of view, and even from the point of view of a pharmaceutical classification, it is astonishing how little there is that might be called new in the matter of dosage form of medicines. It is true that manufacturers have improved on the processes for making one or the other form, but they have contributed little or nothing that can be said to be original so far as variation in form itself is concerned.

The preparations that may be classed as solutions, such as decoctions, infusions, honeys, wines and vinegars, have been in use from time immemorial, and the same is true of many of the solid preparations, such as extracts, powders, pills, troches, ointments and plasters. Elixirs, spirits, tinctures and fluidextracts, were well known to and were probably originated by the Arabian school of medicine, the members of which are also accredited as having introduced suppositories and clysters.

Practically all that has been added to our knowledge of the form of medicine, in recent years, may be said to consist of unimportant modifications that have arisen from a continued desire to mask or to hide the disagreeable taste of many active drugs.

Among the more pronounced of these several modifications are the coated pills and the containers that have been devised for powders and solid drugs. The earliest form of coating was that with gelatin, which was introduced by M. Garot, a Parisian pharmacist, about 1839, as a modification of the gelatin capsule invented by A. Mothes some six or seven years before.

The use of gelatin coating suggested to another Parisian pharmacist the possibility of using a mixture of sugar and gum, or of practically adapting a well-known method for coating almonds for use with ready-made pills.

The now widely used cachets and capsules offer an efficient method for administering powders and masking both odor as well as taste. Gelatin



capsules are of French origin, and, as noted above, were first described by A. Mothes in 1833. The more familiar capsule in two parts is said to have been in practical use in this country so early as 1839.

The cachet de pain is also of French origin, being generally accredited to M. Limousin, of Paris, who introduced them about 1870. This form of masking the odor and taste of powders is being widely used in France and on the Continent of Europe generally, but as yet, it has met with little or no popularity in this country.

With one notable exception, suppositories, the Pharmacopœia of the United States has not followed the generally widespread European practice of having an official definition for the several available forms of medicines.

The National Formulary, on the other hand, goes to the other extreme and essays to define, at times at some length, not alone the nature of the several forms, but also how they should be prepared and dispensed. A careful review of these several definitions will suggest to the practical dispenser that there are not a few difficulties in the way of complying with at least many of the requirements, and that a strict interpretation of the several food and drugs acts would bring, with an attempt at enforcement, an unending train of vexatious annoyances.

It is not infrequently asserted that the dispensing pharmacist is not in position to prepare, either extemporaneously or in quantity, many of the modifications of dosage forms that have come into use during recent years. That these assertions are fallacious can readily be demonstrated by any pharmacist who will take the time to experiment with the many simple directions that are available in the current pharmacopœias or in the available pharmaceutical literature.

Allow me to call your attention to but a few of these forms, the ease with which they are prepared, and to suggest to you that collectively they will constitute a most efficient argument with your neighboring physicians to take an interest in, and to assist you in the present-day attempt to rehabilitate pharmacy in the position that is rightfully hers.

If the eighth edition of the Pharmacopœia of the United States had done nothing more than popularize the really excellent formulæ for effervescent powders, that alone would suffice to insure for it a place among the most progressive books of its kind. The directions are plain and concise, the methods for preparing are simple, and the results are all that could be wished for; the product being slightly, palatable and reasonably permanent.

In this connection it is much to be regretted that the National Formulary continues the complicated and unpalatable combinations of sugar with salts in place of adapting the more simple and more desirable base used in the Pharmacopœia.

Altogether it may safely be said that there are few if any of the official

or unofficial preparations that offer to the dispensing pharmacist a greater field for exploitation than these newly official effervescing preparations. In addition to the preparations that are enumerated in the Pharmacopœia there is an unlimited field for combining or enlarging on the accepted formulæ, and he must be a dull pharmacist indeed who cannot supply any one of the almost innumerable combinations that are possible in this form.

Troches, or cut lozenges, constitute a dosage form that has been altogether too much neglected in this country. The cut lozenges of the British Pharmacopœia, particularly the lozenges with a fruit basis, have much in their favor as compared to the antiquated and unpalatable preparations retained in our own Pharmacopœia. Pharmacists could readily prepare, and develop a demand for, a number of elegant combinations widely used in England, formulæ for which can be found in any one of the standard books of accepted and approved formulas.

Pastilles, a form of troche or lozenge, are practically unknown in this country. In Great Britain and in Europe generally mixtures of active drugs, with a glycerin gelatin base, have been in use for a number of years, and appear to be constantly growing in favor. Pastilles constitute an elegant and altogether efficient method for administering many drugs intended for local action in the mouth and throat. Very satisfactory formulas for this class of preparations may be found in the British Pharmaceutical Codex, a book, somewhat in the nature of a dispensatory, recently published by the Pharmaceutical Society of Great Britain.

Tabella is a name used in the British Pharmaceutical Codex for chocolate tablets. In these preparations advantage is taken of the property possessed by chocolate of masking the taste of many otherwise objectionable substances. Until its recent introduction, by makers of proprietary remedies, chocolate has not been used to any appreciable extent in this country as a vehicle for active medicaments, though it has been widely used abroad.

For drugs having little or no distinctive odor or taste chocolate promises to be of great use as a generally acceptable vehicle. Among the drugs that are adapted to this form of preparation it will suffice to enumerate phenolphthalein, cocain, caffen and glyceryl trinitrate.

Solvellæ, or the soluble tablets of the British Pharmaceutical Codex, are compressed tablets that are fully and freely soluble in water, and are mainly designed for the economic, extemporaneous preparation of astringent or antiseptic solutions.

Among the drugs that are suggested as being adapted for this form of dispensing we have boric acid, zinc sulphate, alum, sodium chloride, phenol and mercuric chloride.

Hypodermic tablets are closely related to the solvellæ enumerated above, though being designed for special use, are in reality a distinct class of preparations. Considering the very widespread use that has been made

of this form of preparation it is surprising indeed that so little attempt has been made to standardize or to provide a generally acceptable form of diluent for hypodermic tablets.

This practical absence of any regulations regarding this important form of medicinal preparation is probably due to the fact that the dispensing pharmacist has generally considered it as being impracticable to make them on a small scale. A few trials will convince any pharmacist of the ease with which this class of preparations can be prepared, and will also suggest to him the possibility of developing the same general form of preparation for a number of substances not necessarily adapted to hypodermatic medication.

In Europe physicians usually prefer ready-made solutions to hypodermic tablets. These solutions are generally dispensed in ampullæ or small vials designed to hold a single dose of the desired medicament. The preparation of these ampullæ has been carefully elaborated, particularly in Germany, where a number of exhaustive papers, bearing on the necessary precautions that are to be observed, have been published. One of the more evident precautions is to exercise due care to insure a neutral reaction of the glass.

Of the available glasses, tubing made from Jena glass is usually preferred, as it has been found to be practically insoluble in water. Another necessary precaution is to carefully control the sterilization of the ampulles so as to insure the innocuousness of the contained solutions. Whether or not ampullæ could be developed as a profitable adjunct to an American pharmacy is problematic, the fact that they are considered to be profitable by European pharmacists is suggestive, and their use as a novelty would certainly appear to be warranted.

These are but a few of the almost innumerable modifications of well-known forms that are available for exploitation by the dispensing pharmacist who could, if he would, establish for himself the reputation of being a leader in his profession and a desirable source of information concerning ways and means of administering medicinal substances.

Discussion was invited on the paper, and Mr. Beringer led off. He said the paper suggested several lines of thought which, if there was time, might be discussed with profit to the members present. The formulas in the British Pharmaceutical Codex differ in many ways from pharmacy as practiced in America. For example, here we do not have formulas for chocolate base tablets as there introduced, and he doubted very much the advisability of some of the things included there in this class. For instance, he doubted the wisdom of introducing phenolphthaleïn and nitroglycerin in this manner. He said he had critically examined the Codex, and it was a model book in many ways, but it contained errors that had crept into the American standard works, and little or no atten-

tion had been paid to the published criticisms, and even corrections of these errors officially announced. He thought there were some views outlined in the paper that deserved very careful consideration. For one thing, he thought the introduction of hypodermic tablets was a thing that could not be adopted in single type form, and if type forms are put in a legal standard it would cause trouble to the pharmacist as well as to the manufacturers who had adopted different bases for the medications, some using neutral alkaline salts and others organic diluents. Even if these ideas were adopted here it would be impossible for the retail pharmacist to compete as to most of them, at least with the manufacturers making them on a large scale. The method of preparing these tablets as now followed was entirely satisfactory in his opinion, and one never hears of any difficulty from lack of sterilization, except in cases of gross carelessness on the part of the physician or nurse using the injection.

Physicians were beginning to investigate these substances, and one of them had asked him quite recently why the druggists did not get up something in simple form in solution that might be used in place of tablet preparations. He warned the retail pharmacists against buying cheap cachets, as they would be found to be like sieves, and the substance would sift through them to a considerable degree. Another thing about cachets was, he had been told by a promoter of these things, that if they could get the druggist to put them up properly and carefully, putting them in the smallest size that they could, they would sell like wildfire. He had found the greatest trouble in the store and laboratory in getting them to put them up properly. They were very seldom half filled, and most of them only about a third so. If made as small as possible, and properly sealed, it was a thing that could be pushed.

Mr. Hallberg said this paper of Mr. Wilbert's touched him deeply, because if there was anything he had been interested in it was the subject of these dosage forms. "There is where we are all weak," he said. Some one has declared—he believed it was the motto of a pharmaceutical or medical journal in New York—that it was better to try to do something, even if you fail, than to attempt to do nothing at all. He thought this attempt in the National Formulary to give directions for preparing these dosage forms was of immense advantage to the retail druggists. Mr. Hallberg said he knew personally of pharmacists who thought that was the best thing that ever happened where the Formulary sets out, for instance, how pills may be extemporaneously coated by enclosing them in the smallest possible gelatin capsules, and where extemporaneous coating may be made with sugar. The knowledge of how to do these things will enable the pharmacist to say to the physician when he comes to him with a prescription containing three or four different ingredients, "The National Formulary says it may be done this way," and he will say, "Oh, does it? That is all right then, go ahead and make it." Otherwise, the pharmacist

may have on his shelf the tablets or pills or capsules, whatever it may be, but instead of calling for  $\frac{1}{48}$  of a grain of strychnine, for instance, the prescription may call for  $\frac{1}{84}$  of a grain, and the pharmacist will have to trace around to the wholesale house—it may be at night, it may be Sunday—in the effort to try to find the particular pill. Mr. Hallberg said he personally knew of a great many instances where this had worked very well indeed, showing the physician how this could be done.

Continuing, Mr. Hallberg said that Mr. Wilbert was right about the U. S. Pharmacopœia having proposed no improvement in troches for the last thirty or forty years. The troches of the British Pharmacopœia were, he said, far superior to ours, containing as they do some four or five different basic vehicles, of black currant jelly and things of that kind. He said if pharmacists would make such troches and give the physicians the benefit of their knowledge the compressed tablets of to-day would soon be relegated to the past. He described the disagreeable qualities of tablets containing ammonium chloride, for instance, when taken into the mouth and dissolved by the saliva, and said that people had almost ceased to buy them, and it was difficult to sell them any longer. He described the attraction of the mass-made troches, which he said were delightful. "The children cry for them, and that is the kind of medicine we want to prepare when it comes to the elegant pharmaceuticals."

Mr. I. A. Becker, of Chicago, gave his testimony to the increased demand for ampulles, as evidenced in his hospital experience. He said the doctors—ex-internes—would go to Europe every year or so, and would return much taken with the idea of these ampulles, and were calling for them more and more all the time.

Mr. Osseward said he had a physician who did a great deal of this line of practice, in the mercury salts especially, and he was very particular about the quality and character of his salts, and they had adopted the practice of putting them up in little vials, just a dose, say, in a vial, and that had proven very satisfactory indeed. He said it would be more convenient, however, to have these ampulles, where they were properly sealed.

Mr. Seltzer said that it was possible for the pharmacist to make these ampulles right in his own store. He had a customer coming from abroad who would bring him a prescription for them, and he had had presented to him only a few days before a new formula, which he was not prepared to fill; the customer saying the pharmacist where he came from put them up extemporaneously; but he did not have the facilities at hand to make them. He thought it was quite practicable, however, for that kind of work to be done extemporaneously.

The Chair stated that the paper of Mr. Wilbert would take the usual course.

The Chair said that the Section had now reached the limit of papers upon the program. He took occasion to exhibit before the members a

new stirring-rod, made of vulcanized rubber, imported by a Philadelphia house from abroad, the cost being eleven cents each, when bought through the Co-operative Drug Company, it was not brittle like the glass stirring-rod, and consequently much more durable. This little device was inspected by a number of the members.

The Chair declared the installation of officers the next order of business. He said, however, that before the installation took place he wanted to extend to the Section his hearty thanks for the kind and prompt attention of the members at this meeting. It had been a real pleasure to work for the Section, even though it had been hard work. Although he had had to neglect his own business to attend to the work of the Section he nevertheless had no complaint to make. He said that in the future he would be only too pleased to do all that he could in every possible way for the benefit of the Section, working in the ranks.

The Chair appointed as a committee to escort the Chairman-elect to the rostrum Messrs. Hynson and Kaemmerer, and these gentlemen brought Mr. Seltzer forward and introduced him to the Chair. The Chair said it gave him great pleasure to resign his office to Mr. Seltzer, for he knew he would find the work interesting, and he felt sure that the Section had made no mistake in selecting him for the office of Chairman. By consulting the Proceedings, he said, he found that Mr. Seltzer had attended his first meeting of the Association in the year 1899, and he was surprised that a man with a name so suggestive of activity as "Seltzer" had not been heard from long before this. (Laughter.) He said he would now be given an opportunity to boil forth, as all good seltzers should do.

Mr. Seltzer said there was not very much in a name, he feared, but he thanked the Section for the distinction they had conferred upon him, and promised to do the best he could; how much that would be time would tell.

Mr. Seltzer here took the Chair.

The other members of the committee were not present and could not be installed.

Mr. Hallberg moved a vote of thanks by the Section to the retiring officers, and especially to the Chairman, Mr. Franklin M. Apple, of Philadelphia, for the very interesting program and the work that he had presented before the Section. This motion was seconded by Mr. Searby, and on motion of Mr. Hynson was carried by a unanimous rising vote amid the applause of the members. Mr. Apple said he accepted the kind expressions of the members with the deepest, most heartfelt thanks.

Mr. Hynson humorously moved that the Section congratulate Mrs. Apple upon having such a handsome and nice husband. Mr. Good seconded this motion, but said he thought the reverse of this was equally true, and that Mr. Apple should be congratulated upon having such a charming wife. This motion was seconded by Mr. Payne and carried unanimously.

On motion, the Section then stood adjourned sine die.

# MINUTES

## OF THE

### SECTION ON HISTORICAL PHARMACY.\*

The first meeting or open session of the Section was held Thursday evening, when Chairman Howell introduced Dr. Whelpley to a large audience, which listened for an hour to a talk on "Past meetings and past members," which was illustrated by lantern slides.

The regular business session was held Friday morning, Mr. E. V. Howell in the chair, and Mr. E. G. Eberle acting as Secretary. In place of a formal address, the Chairman made a few remarks on the importance of collecting the vast material scattered everywhere, and then proceeded to discourse on a number of subjects in which he had taken a special interest as collector. These topics are included in the list given below. He also exhibited a considerable number of objects of historic interest, on which, however, he was not ready to make a final report at this time. Among these were poppy capsules grown in North Carolina, which yielded an opium containing six per cent. of morphine; specimens from the Pinehurst Tea Gardens at Summerville, S. C., and wools and cloths dyed by the natives of North Carolina with vegetable dyes.

*M. I. Wilbert:* An Interesting Pharmacopœia and Some Hospital Formularies. The speaker presented a manuscript copy of a German translation of the Hannoverian Pharmacopœia of 1842, which he had found in one of the book-stalls of St. Louis, on his way from Philadelphia to Hot Springs. The original owner appears to have been one Emil Seemann, about whom information is desired. To the collection of hospital formularies already contributed to the archives of the Association, the speaker added those of the Boston City Hospital, the Roosevelt Hospital, Syracuse Hospital, Hospital of the Good Shepherd, West Penn Hos-

---

\* Owing to the fact that the local stenographer failed absolutely to make a report of the work of this Section, it became necessary to call upon the officers of the Section to furnish an account of what had been done, and the historian, Mr. Edward Kremers, kindly supplied the necessary material.—*The General Secretary.*

pital, Philadelphia Hospital, New York Hospital, and City Hospital of Worcester, Mass.

*A. H. Clark*: Sketch of Walter B. Kilner. A short biographical sketch of the author of Kilner's Formulary, now well-nigh forgotten.

*Nellie Wakeman*: The Phytochemical Work of Henry Trimble. A brief review and bibliography of the plant-chemical aspects of the work of this investigator. Published in *Ph. Rev.*, 26, p. 338.

*L. F. Kebler and V. K. Chestnut*: The Drug Collection at Washington. An historical account of the collection of 2,000 drugs and medicinal plants in the National Museum, Department of Anthropology, Division of Medicine.

*S. J. Hinsdale*: Early Drug Conditions in Connecticut, 1835. Mr. Howell presented, with some remarks, a copy of this paper read before the North Carolina Pharmaceutical Association in 1880.

*E. V. Howell*: Tea Cultivation in North Carolina. A collection of pamphlets and illustrated articles on Dr. Shepard's work at Pinehurst, near Summerville.

———: Early Pharmaceutical Laws of Great Britain. A copy of references from the laws pertaining to the examination of physicians in dioceses out of London. 14 and 15 Henry VIII, c. 5, par. 3.

———: Synonyms of 1548, 1653 and 1769. Copies of several sets of synonyms. These are supplementary to those previously contributed by Mr. Howell.

———: The Crude Drug Business in North Carolina. Several documents, including photographs, bearing on the collection and commerce of crude drugs in the mountainous districts.

*Henry Kraemer*: A. Ph. A. badges. A collection of badges used by the earlier officers of our Association.

*Edw. Kremers*: The Apothecary and Related Characters in Jost Amman —Hans Sachs, "Beschreibung aller Stände auf Erden." This account, with fac-simile reproductions of the physician, apothecary, barber, dentist, cupper, etc., has been published in the *Ph. Rev.*, 26, pp. 342 and 357.

———: Some Pharmaceutical Book-plates. The speaker called attention to a collection of pharmaceutical *ex libris*, mostly of German and Swiss pharmacists. He traced one of these to a wood-cut of Jost Amman, and called attention to the fact that some of the older pharmaceutical treatises contain an abundance of illustrative material that will readily lend itself to similar treatment. The reproductions of the book-plates shown have appeared in the *Ph. Rev.*, *c. g.*, 18, p. 484; 19, p. 95 of Suppl.; 21, pp. 457 and 458, etc.

Edward Kremers then read his report as Historian of the Association, as follows:



## REPORT OF THE HISTORIAN.

Because of absence in Europe for practically one-half of the time since the last annual meeting in New York a year ago, your Reporter has not been as active a collector as in previous years. The appended list, however, reveals the fact that the past year has not slipped by entirely without new accessions.

If the work of collection has not kept pace with previous years, something of greater immediate importance has been accomplished. Owing to the appropriation of \$25.00 made by the Council at the request of this Section, your Reporter has been enabled to secure clerical assistance in the mounting of documents and their classification. Miss Nellie Wakeman has devoted a good share of her vacation to the mounting of some 1,500 to 2,000 documents, and has arranged them in such a manner that they can be permanently classified and made available to students of the history of our calling. While in the past years your Reporter has gladly spent many an evening doing work of this nature, the accumulations since 1902 had grown to such an extent that each additional contribution of miscellaneous documents threatened discouragement instead of proving a new source of enthusiasm.

I would suggest, therefore, that this Section ask for another appropriation of \$25.00 for clerical work and also for a like sum for material. Paper for mounting and covers for mounted and classified documents are as essential as clerical assistance. If the Association desires to ask for space in the National Museum two years hence much work will have to be done in order that such a request may be backed up by something more than an expression of a desire to utilize the space we intend to ask for. If we can make a good showing of work already done our request will unquestionably be more favorably received than otherwise.

On the other hand there are many things in the way of collection that it would be unwise to attempt at the present time. What we need most of all at the present time is the promise of collections now in the hands of members of this Association. A few of such promises have already been received, but we need many more.

Your Historian cannot refrain, in closing his brief report, from alluding to the pharmaceutical collections he has seen while abroad last fall and winter. While fully appreciating the pharmaceutical collections of individuals, of educational institutions and cities, two collections stand out prominently in his memory, viz., those of Nuremberg and Zurich. These are the model exhibits of the national museums of Germany and Switzerland respectively, such as we should have at Washington. When the time for asking for space at Washington has arrived it will afford me great pleasure to give to this Section a fair idea of what has been done along this line by other countries, and to indicate what we as a national Association ought to attempt. If meanwhile some of our pharmaceutical manufacturers were to supply the means necessary to purchase some of the private collections in the hands of several European collectors and offered for sale, we might take a very great step indeed toward the realization of our goal.

On motion the report was referred for publication in the Proceedings. Nominations for officers for the ensuing year being in order, the following gentlemen were placed in nomination and duly elected: John B. Bond, Sr., of Little Rock, Ark., Chairman; Eugene G. Eberle, of Dallas, Tex., Secretary; Edward Kremers, of Madison, Wis., Historian. The Section then adjourned.

## ENTERTAINMENTS AT THE FIFTY-SIXTH ANNUAL MEETING.

---

BESIDES the many points of interest provided by Nature at Hot Springs, Ark., to which all visitors were attracted, a series of pleasant entertainments had been arranged by the members of the local committee and their ladies. The usual reception and ball were held at the Arlington Hotel on Monday evening, September 7, which were largely attended and much enjoyed. On Tuesday afternoon the visiting ladies were treated to a delightful mountain drive, and in the evening they enjoyed a card party at the Arlington Hotel.

A reception and musicale were held at the Majestic Hotel on Wednesday afternoon and an informal dance at the Arlington Hotel in the evening of the same day.

On Thursday a visit was made to the famous alligator and ostrich farms which proved quite instructive, and afterward the delegates and their ladies were royally entertained at a reception tendered by Mrs. Henry Weimar at her home. In the evening Dr. Henry M. Whelpley, of St. Louis, Mo., delivered an interesting lecture at the Eastman Hotel on Past Meetings and Officers. For the male members of the Association, probably the most enjoyable entertainment of the week was the Smoker, given on Thursday evening at the Eastman Hotel, after adjournment of the meeting of the Conference of Pharmaceutical Faculties. Mr. C. S. N. Hallberg as presiding genius was at his best and old and young alike were made to contribute to the pleasure of the large assembly by speeches and songs until the wee small hours of the morning.

A card party for the ladies at the Arlington Hotel and an informal dance at the Majestic Hotel on Friday afternoon and evening respectively brought the week's entertainments to a close.

Special thanks are due the pharmacists of Arkansas for the generous hospitality extended by their representatives Mr. and Mrs. M. A. Eisele, Mr. and Mrs. Henry Weimar, Mr. and Mrs. A. C. Jennings, Mr. and Mrs. W. L. Dewoody, Mrs. S. D. Knox, Mrs. O. K. Hukill, Mr. W. S. Sorrell, Mrs. C. Walter Lehman, Mrs. W. H. Lusby, Mrs. J. M. Proctor, Miss Mary A. Fein, Miss Frances Eisele, Miss Josephine Bond, Miss Emma Dewoody, Miss Carrie Price, Messrs. Frank Schachleiter, E. F. Klein, J. B. Bond, Sr., Frank Walker, R. G. Moore, F. W. McClerkin, L. K. Snodgrass, J. F. Dowdy, J. A. Ginnochio, A. W. Stahel, W. R. Appleton, J. W. Morton and Henry Bordeaux.

# APPENDIX.

## ALPHABETICAL LIST OF NAMES OF MEMBERS FROM WHOM MONEY HAS BEEN RECEIVED BY THE TREASURER FOR ANNUAL DUES OR CERTIFICATES, FROM JULY 1, 1907, TO JULY 1, 1908.

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Abbett, William A.....	'07	\$5 00	Amount brought forward.....	\$350 00	\$16 00
Abernathy, John C....'05-'06-'07	15 00		Bartells, George C. ....	'07	5 00
Abreu, Gerardo F.....	'07	5 00	Bartlett, James E.....	'08	5 00
Ackerman, Philip J.....	'07-'08	10 00	Bartley, Elias H.....	'08	5 00
Acosta, Joaquin.....	'07	5 00	Base, Daniel.....	'08	5 00
Adamick, Gustave H.....	'08	5 00	Baskette, Frank E.....	'07	5 00
Adams, Arthur E.....	'07-'08	10 00	Bastian, Otto C.....	'08	5 00
Adams, Henry.....	'07	5 00	Bate, Henry J.....	'07-'08	10 00
Adams, James H.....	'07-'08	10 00	Baughman, Leo M.....	'07	5 00
Alacin, José P.....	'07	5 00	Baur, Jacob.....	'08	5 00
Alexander, David J. K.....	'07	5 00	Bayly, Charles A.....	'07	5 00
Allen, Andrew C.....	'07	5 00	Beal, George D.....	'07	5 00
Allen, E. Floyd.....	'07-'08	10 00	Beal, James H.....	'08	5 00
Allison, Samuel P.....	'07	5 00	Bear, Pierce B.....	'07-'08	10 00
Allison, William O.....	'08	5 00	Becker, Charles L.....	'07	5 00
Alpers, William C.....	'07	5 00	Becker, Ulrich W.....	'08	5 00
Anderson, William C.....	'08	5 00	Behrens, Emil C. L.....	'08	5 00
Andreen, Carl.....	'07-'08	10 00	Beilstein, Christian.....	'07	5 00
Anspach, Paul B.....	'07	5 00	Bell, Emil R.....	'08	5 00
Apmeyer, Charles A.....	'08	5 00	Benfield, W. Edwin.....	'08	5 00
Apple, Franklin M.....	'08	5 00	Bent, Edward C.....	'07	5 00
Appleton, William R.....	'08	5 00	Berg, Albert S.....	'08	5 00
Arneson, Thomas.....	'07	5 00	Berger, Ernest.....	'07	5 00
Arnold, William C.....	'08	5 00	Berger, Louis.....	'07	5 00
Army, Harry V.....	'07-'08	10 00	Beringer, George M.....	'08	5 00
Asher, Philip.....	'07	5 00	Beringer, George M. Jr.....	'07-'08	10 00
Ashim, B. J.....	'08	5 00	Berner, Carl A.....	'07-'08	10 00
Askew, Alfred J.....	'06	5 00	Bernström, Gustaf.....	'07	5 00
Aughinbaugh, David C.....	'07	5 00	Berryhill, Henry P.....	'07	5 00
Avery, Charles H.....	'06-'07	10 00	Best, Samuel M.....	'07	5 00
Avery, Henry M.....	'07	5 00	Bethea, Oscar W.....	'07	5 00
Avis, James L.....	'07	5 00	Bevens, J. L.....	'07	5 00
Ayres, Albert J.....	'07-'08	10 00	Beyschlag, Charles.....	'08	5 00
Ayres, Gold.....	'07	5 00	Biermann, William H.....	'08	5 00
Bachelle, Rudolph von.....	'07	5 00	Bigelow, Clarence O.....	'07	5 00
Bachman, Gustav.....	'08	5 00	Bingham, Chas. C.....	'07	5 00
Bacon, Ephraim.....	'07	5 00	Biosca, Placido.....	'07	5 00
Baer, Edward A.....	'07	5 00	Blackwood, Russell T.....	'08	5 00
Baer, Jacob M.....	'08	5 00	Blahnik, Karel B.....	'07	5 00
Baigent, John T.....	'07	5 00	Blahnik, Marie.....	'08	5 00
Bailey, William E.....	.....	3 00	Blahnik, Venzel L.....	'07	5 00
Baily, G. Frank.....	'08	5 00	Blair, Henry C.....	'07-'08	10 00
Baird, Julian W.....	'08	5 00	Blakeslee, Louis G.....	'07	5 00
Baker, Edwin.....	'06	5 00	Blanding, William O.....	'08	5 00
Baker, Gustavus.....	'08	5 00	Blank, Herman G.....	'07	5 00
Baldaup, Julius L.....	'07	5 00	Blumenschein, Fred. J.....	'07	5 00
Ballagh, Willred T.....	'08	5 00	Roberg, Otto J. S.....	'08	5 00
Baltzly, Albert B.....	'07	5 00	Bodemann, Wilhelm.....	'07	5 00
Baltzly, Zachariah T.....	'08	5 00	Boeddiker, Otto.....	'08	5 00
Bancroft, Richard B.....	'07	5 00	Boehm, John J.....	'07	5 00
Bandy, George.....	'07	5 00	Boehm, Solomon.....	'07	5 00
Bange, Otto F.....	'07	5 00	Boerner, Emil L.....	'07	5 00
Banke, Walter C.....	'07	5 00	Bohmansson, Robert H.....	'08	5 00
Bard, William E.....	'08	5 00	Bohn, George W.....	'07	5 00
Barnard, Harry A.....	'07	5 00	Boldt, Fred. W.....	'06-'07-'08	15 00
Barnes, Henry C.....	'07-'08	10 00	Bond, John B.....	'08	9 00
Barnett, Joel J.....	'07	5 00	Bond, William C.....	'07-'08	10 00
Barrett, Charles L.....	'05-'06-'07	15 00	Bongartz, Ferdinand A.....	'08	5 00
Amount carried forward.....	\$350 00	\$16 00	Amount carried forward.....	\$675 00	\$16 00

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward .....	\$675 00	\$16 00	Amount brought forward.....	\$1100 00	\$28 50
Booth, Albert E. .... '07	5 00		Clayton, Charles J. .... '07-'08	10 00	
Bordeaux, Henry .. '07-'08	10 00		Cliffe, William L. .... '07	5 00	
Borell, Henry A. .... '07-'08	10 00		Cline, Raoul R. D. .... '07	5 00	
Bosque, Arturo .....	5 00		Clothier, C. Roland .. '07-'08	10 00	
Bothwell, Samuel F. .... '07	5 00		Clough, Frank H. .... '07-'08	10 00	
Boulton, Emison A. .... '07	5 00		Cobb, Ralph L. .... '08	5 00	
Bower, Edward A. .... '07	5 00		Coblentz, Virgil .....	5 00	
Bowman, Waldo M. .... '08	5 00	5 00	Cohn, Alfred I. .... '07	5 00	
Boyken, John W. .... '07	5 00		Colby, Charles L. .... '08	5 00	
Boyson, John H. .... '07	5 00		Cole, Victor L. .... '07	5 00	
Brack, Charles E. .... '08	5 00		Coleman, John .....	5 00	
Bradbury, Wymond H. .... '07	5 00		Coleman, John H. .... '08	5 00	
Bradley, Theodore J. .... '08	5 00		Collins, Albert B. .... '07	5 00	
Bradt, Warren L. .... '07	5 00		Colpin, Emanuel E. .... '07	5 00	7 50
Brand, Joseph H. .... '07-'08	10 00		Comfort, Newton C. .... '07	5 00	
Brashear, Owen L. .... '07	5 00		Cone, John W. .... '06-'07	10 00	
Brecht, Frederick A. .... '07	5 00		Conger, Frederic A. .... '07-'08	10 00	
Brenner, George F. .... '07-'08	10 00		Connelly, Fred W. .... '07	5 00	
Brewer, Howard D. .... '07	5 00		Conzet, Rufus W. .... '08	5 00	
Briggs, Armand E. .... '07	5 00		Cooban, Benjamin S. .... '07-'08	10 00	
Brinker, John H. .... '07-'08	10 00		Coody, A. Stinson .....	10 00	
Brinton, Clement S. .... '07	5 00		Cook, E. Fullerton .....	5 00	
Brisley, Harry .....	5 00		Cook, James O. .... '07	5 00	
Bromme, William L. .... '07	5 00	7 50	Cook, Thomas P. .... '07-'08	10 00	
Brookes, Virginia C. .... '07	5 00		Coonley, Charles .....	10 00	
Brooks, George W. .... '07-'08	10 00		Coons, William J. .... '07	5 00	
Brown, George S. .... '05	5 00		Cooper, James E. .... '07-'08	10 00	
Brown, J. Lee .....	5 00		Cornell, Edward A. .... '07	5 00	
Brown, Lewis W. .... '07	5 00		Coté, André A. .... '07	5 00	
Brucker, Carl .....	5 00		Coulson, James T. .... '07	5 00	
Brundage, Albert H. .... '07	5 00		Craft, Oliver A. .... '07	5 00	
Brunn, Harold N. .... '07	5 00		Craig, Hugh .....	5 00	
Bryson, William S. .... '07	5 00		Cramer, Max .....	5 00	
Bucknam, Frank W. .... '07	5 00		Crampton, Ferd L. .... '06-'07	15 00	
Bunting, George A. .... '07	5 00		Cranshaw, Herbert H. .... '07	5 00	
Burke, Walter J. .... '07	5 00		Creighton, Mary I. .... '08	5 00	
Burke, William T. .... '07	5 00		Criswell, Francis M. .... '07	5 00	
Burnham, Alfred A., Jr. .... '08	5 00		Cross, Elias H. .... '07-'08	10 00	
Burnham, Ralph F. .... '08	5 00		Crouch, William T. .... '08		5 00
Burrough, Horace, Jr. .... '07-'08	10 00		Cuervo, Adolfo .....	5 00	
Burton, John C. .... '05-'06	10 00		Culbreth, David M. R. .... '07-'08	10 00	
Busch, Miers .....	5 00		Curd, Thomas N. .... '07	5 00	
Buthlein, Fred L. G. .... '08	5 00		Curquejo, Antonio G. .... '07	5 00	
Butsch, John L. .... '07	5 00		Curry, David W. .... '08	5 00	
Butters, Charles H. .... '07	5 00		Curry, Gordon L. .... '05	5 00	
Cadinus, Robert C. .... '07	5 00		Cuthbert, Richard W. .... '08	5 00	
Caine, S. Lee .....	5 00		Dadd, Robert M. .... '07-'08	10 00	
Cajulia y Samedra, Felix .... '07	5 00		Daggett, V. Chapin .....	5 00	
Campbell, Charles B. .... '07	5 00		Danek, John F. .... '07-'08	10 00	
Campbell, George S. .... '07	5 00		Dare, Charles F. .... '07	5 00	
Campbell, Milton .....	5 00		d'Artenay, Eugene .....	5 00	
Campbell, Theodore .....	10 00		Davis, Charles H. .... '07	5 00	
Cantor, Lorenz .....	5 00		Davis, Charles L. .... '08	5 00	
Capdau, Pierre A. .... '08	5 00		Davis, Daniel F. .... '07	5 00	
Carpenter, William A. .... '07	5 00		Davis, Eugene M. .... '06-'07	10 00	
Carpote, José .....	5 00		Dawson, Charles H. .... '07	5 00	
Cartaya, Julio H. .... '07	5 00		Dawson, Edward B. .... '07	5 00	
Carter, Frank H. .... '07	5 00		Dawson, John H. .... '07	5 00	
Carter, Frederick L. .... '07	5 00		Day, Edward J. .... '07	5 00	
Case, George E. .... '07	5 00		Day, William B. .... '07	5 00	
Caseldine, Harry C. .... '07	5 00		De Barr, Edwin .....	5 00	
Caspari, Charles Jr. .... '08	5 00		De Jonge, Cornelius .....	5 00	
Caspari, Charles E. .... '08	5 00		De Lorenzi, Albert .....	5 00	
Cassaday, O. U. .... '08	5 00		Deakyné, Harry H. .... '08	5 00	
Cassin, Elmer E. .... '07	5 00		Dean, H. G. .... '07	5 00	
Castleman, Karl .....	5 00		Deck, Lewis C. .... '08	5 00	
Chantler, Vincent H. .... '07	5 00		Deibert, Thomas I. .... '07-'08	10 00	
Cheney, Arthur L. .... '08	5 00		Deming, William A. .... '07	5 00	
Cheatham, Thomas A. .... '05-'06	10 00		Depeyre, Louis N. .... '07	5 00	
Clafin, Walter A. .... '08	5 00		Deuel, C. Fred. .... '07-'08	10 00	
Clapham, Hesser C. .... '07	5 00		Dewender, William H. .... '08	5 00	
Clark, Albert H. .... '07	5 00		Diaz, José G. .... '07-'08	10 00	
Clark, John A. .... '07	5 00		Dicks, Frederick A. .... '07-'08	10 00	
Clarke, Charles J. .... '07	5 00		Dickson, Fred W. .... '07	5 00	
Claus, Otto F. .... '07	5 00		Diekman, George C. .... '08	5 00	
Amount carried forward.....	\$1100 00	\$28 50	Amount carried forward.....	\$1575 00	\$41 00

	Annual Dues.	Certificates		Annual Dues.	Certificates
Amount brought forward.....	\$1575 00	\$47 00	Amount brought forward.....	\$2025 00	\$48 50
Diggs, Lowell C.....	07 50		Finch, Charles S.....	07 50	
Dillenback, Garrett V. de V.....	08 5 00		Fink, Daniel J.....	08 5 00	
Dilly, Oscar C.....	08 5 00		Finneran, James F.....	07 5 00	
Dimmitt, Addison.....	08 5 00		Finninger, Paul E.....	07 5 00	
Dimond, Harry J.....	08 5 00		Fischer, Henry J.....	07 5 00	
Diner, Jacob.....	07 5 00		Fischer, Henry J.....	08 5 00	
Dinkler, Frank A.....	07-08 10 00		Fisher, George W.....	08 5 00	
Dittmeyer, Walter E.....	07-08 10 00		Fleischner, Charles.....	08 5 00	
Dixon, J. Marion.....	08 5 00		Flemer, Lewis.....	07 5 00	
Dodds, Richard N.....	07 5 00		Fletcher, David M.....	08 5 00	
Dohme, Alfred R. L.....	07-08 10 00		Fogas, William H.....	07 5 00	
Dohme, William I.....	07 5 00		Forbes, J. Winchell.....	07 5 00	
Donahue, Henry M.....	07 5 00		Foster, John B.....	07-08 10 00	
Donohue, Henry.....	07 5 00		Fouch, William M.....	07-08 10 00	
Dorb, Edward H.....	08 5 00		Foulke, James.....	08 5 00	
Dow, John C.....	07 5 00		Fox, Willard M.....	07 5 00	
Downes, Edwin R.....	07 5 00		Frailey, William O.....	07-08 10 00	
Downing, Benj. T., Jr.....	07-08 10 00		Frames, J. Fuller.....	07 5 00	
Dreuhl, Louis A.....	08 5 00		Francis, John M.....	07 5 00	
Drossel, August A.....	07 5 00		Franzoni, Joseph D.....	07 5 00	
Drucker, August F.....	07 5 00		Fraser, Horatio N.....	08 5 00	
DuBois, William L.....	07 5 00		Frauer, Herman E.....	07 5 00	
Dulaney, Joseph F.....	06-07 10 00		Freericks, Frank H.....	07 5 00	
Dunning, H. A. Brown.....	07-08 10 00		French, Harry B.....	08 5 00	
Durban, Sebastian C.....	05-06-07 15 00		French, Howard B.....	07-08 10 00	
Dye, Clair A.....	07-08 10 00		Fricke, Frederick G.....	08 5 00	
Easterday, Herbert C.....	07 5 00		Fricke, Frederick H.....	07 5 00	
Ebbs, John B.....	07-08 10 00		Friedenburg, M. W.....	08 5 00	
Eberhardt, Ernest G.....	07 5 00		Friesenecker, Charles M.....	07 5 00	
Eberle, Arthur R.....	07-08 10 00		Frost, William A.....	08 5 00	
Eberle, Eugene G.....	08 5 00		Fry, Herman.....	08 5 00	
Eberle, Herman T.....	08 5 00		Fry, N. George.....	07-08 10 00	
Eccles, Robert G.....	08 5 00		Frye, George C.....	08 5 00	
Eckert, John.....	07 5 00		Gabell, Cromwell P.....	07 5 00	
Eckler, Charles R.....	07 5 00		Gable, Ralph B.....	06-07 10 00	
Eckstein, Andrew J.....	07 5 00		Gaddess, John.....	08 5 00	
Eichold, Bernard H.....	07 5 00		Gaddess, Thomas.....	08 5 00	
Eichrodt, Mary E.....	07 5 00		Gaesser, Theobald T.....	08 5 00	
Eisele, Martin A.....	07-08 10 00		Gallagher, John C.....	07-08 10 00	
Elam, John T.....	07 5 00		Gallenkamp, Edw. W.....	07 5 00	
Eldred, Frank R.....	07 5 00		Galvin, Matthew.....	08 5 00	
Elgin, Lewis L.....	07 5 00		Gamble, Stewart.....	08 5 00	
Eliel, Leo.....	08 5 00		Gammon, Irving P.....	07 5 00	
Elliott, Charles H.....	07 5 00		Gane, Eustace H.....	07 5 00	
Ellis, William H.....	07 5 00		Gano, William H.....	07 5 00	
Ely, Ernest S.....	08 5 00		Ganzly, William H.....	08 5 00	
Emmanuel, Julia.....	07-08 10 00		Gape, Arthur G.....	06 5 00	
Engelhard, George P.....	05 5 00		Garber, Elmer F. W.....	08 5 00	
Engelhardt, Hermann.....	07 5 00		Garrett, Oscar N.....	07 5 00	
England, Joseph W.....	07 5 00		Gathercoal, Edmund N.....	06-07 10 00	
English, William M.....	07 5 00		Gaus, Charles H.....	08 5 00	
Engstrom, Ernst O.....	07 5 00		Gausby, Robert A.....	07 5 00	
Ennis, Ephraim L.....	08 5 00		Gayle, John W.....	08 5 00	
Eppstein, Jacob.....	07-08 10 00		Geisler, Joseph F.....	07 5 00	
Erhart, William H.....	07 5 00		Gerald, Herbert F.....	07-08 10 00	
Eschmann, Clemens L.....	07 5 00		Gering, Henry R.....	07-08 10 00	
Estabrook, Henry A.....	07 5 00		Gertler, John H.....	07 5 00	
Estenoz, Francisco R.....	07 5 00		Gessner, Emil A.....	08 5 00	
Esters von Krakau, William.....	07 5 00		Gibson, Frank L.....	07-08 10 00	
Evans, Arthur S.....	07-08 10 00		Gidley, William F.....	07 5 00	
Evans, George B.....	08 5 00		Gietner, Charles.....	07 5 00	
Eyssell, George.....	07 5 00		Gilman, Elbridge W.....	07-08 10 00	
Fairchild, Benj. T.....	08 5 00		Gilpin, Henry B.....	08 5 00	
Fairchild, Samuel W.....	08 5 00		Gleason, Patrick S.....	08 5 00	
Fanous, Amin.....	07 5 00		Gleghorn, James S.....	07 5 00	
Fantus, Bernard.....	08 5 00		Glover, William H.....	07 5 00	
Feick, Charles.....	07 5 00		Godbold, Fabius C.....	07 5 00	
Feil, Joseph.....	07 5 00		Godding, John G.....	08 5 00	
Fein, Mary A.....	07 5 00		Golaz, Ernest H.....	07 5 00	
Ferger, Edward.....	07 5 00		Goldsborough, Chas. H.....	07 5 00	
Ferguson, George A.....	07 5 00		Goodale, Harvey G.....	06-07 10 00	
Fickhardt, Fred. L.....	07 5 00		Goodman, Frank S.....	07 5 00	
Fieber, Gustavus A.....	07 5 00		Goodman, Laura.....	07 5 00	
Field, Claude.....	07 5 00		Gordin, Henry M.....	08 5 00	
Figuroa, Ernesto V.....	07 5 00		Gordon, William C.....	07 5 00	
Amount carried forward.....	\$2035 00	\$48 50	Amount carried forward.....	\$2465 00	\$48 50

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward .....	\$2465 00	\$48 50	Amount brought forward .....	\$2945 00	\$48 50
Gorgas, George A. .... '08	5 00		Hays, Francis B. .... '08	5 00	
Gorman, Mary C. .... '07-'08	10 00		Hebbard, Edw d S. .... '07	5 00	
Grace, William D. .... '07	5 00		Heebner, Charles F. .... '07	5 00	
Graebner, Otto H. .... '07-'08-'09	15 00		Hegarty, Charles K. .... '08	5 00	
Graham, Abner B. .... '07	5 00		Heim, William J. .... '08	5 00	
Graham, Karl H. .... '07	5 00		Heinemann, Albert F. '06-'07-'08	15 00	
Graham, Willard .... '05-'06-'07	15 00		Heinemann, Lucy. .... '08	5 00	
Grassly, Charles W. .... '07	5 00		Heinitsh, Sigmund W. .... '07	5 00	
Green, Arthur L. .... '08	5 00		Heinritz, Lebrecht G. .... '08	5 00	
Green, Benjamin .... '08	5 00		Heiss, Ernest J. .... '07	5 00	
Green, Carl V. .... '07	5 00		Helfman, Joseph. .... '07	5 00	
Green, Edward T. .... '07	5 00		Heller, Charles T. .... '07	5 00	
Green, Robert L. .... '07	5 00		Hellmuth, Joseph A. .... '07-'08	10 00	
Greenawalt, S. Miller. .... '07-'08	10 00		Hemm, Francis .... '07	5 00	
Greenawalt, William G. .... '08	5 00		Henkel, Alice. .... '07	5 00	
Gregorious, George .... '07	5 00		Henkel, Charles B. .... '07	5 00	
Gregorious, William P. .... '07	5 00		Henne, Louis E. .... '06-'07	10 00	
Greule, Albert M. .... '07	5 00		Henning, Adolph .... '07-'08	10 00	
Grewe, Louis F. .... '07	5 00		Henry, Frank C. .... '07	5 00	
Greyer, Julius .... '08	5 00		Hepburn, John. .... '07	5 00	
Griffin, Lyman W. .... '08	5 00		Herbst, William P. .... '07	5 00	
Griffis, Orville A. .... '07	5 00		Hereth, Frank S. .... '07-'08	10 00	
Griffith, Charles .... '07	5 00		Hermanek, Joseph C. .... '08	5 00	
Griffith, J. Arthur. .... '07	5 00		Herpich, John L. .... '07-'08	10 00	
Gross, Charles E. .... '07	5 00		Herrera, Francisco .... '07	5 00	
Gross, William O. .... '07	5 00		Herty, Frank J. .... '07	5 00	
Groves, Henry C. .... '07	5 00		Hess, Paul L. .... '07	5 00	
Guehring, John, Jr. .... '07	5 00		Heuiler, Philip L. .... '07	5 00	
Guerin, James F. .... '07	5 00		Hickerson, William H. .... '08	5 00	
Guidry, Ambrose J. .... '07	5 00		High, Raymond L. .... '06-'07-'08	15 00	
Gundrum, George .... '07	5 00		Hilton, Samuel L. .... '07	5 00	
Haake, William H. .... '07	5 00		Hires, Lewis M. .... '07	5 00	
Hackenberger, George W. .... '07	5 00		Hirseman, Felix. .... '07	5 00	
Haeger, Fred. .... '07	5 00		Hiss, A. Emil .... '07-'08	10 00	
Hagans, Daniel A. .... '07-'08	10 00		Hitchcock, John E. .... '07-'08	10 00	
Hagee, William P. .... '08	5 00		Hoch, Aquila. .... '07-'08	10 00	
Hagenow, Theodore F. .... '07	5 00		Hoch, Quintus .... '08	5 00	
Hahn, Charles W. J. H. .... '07	5 00		Hodgson, Joseph A. .... '08	5 00	
Hain, Frank W. A. .... '07	5 00		Hodson, Daniel F. .... '07	5 00	
Hale, Frank P. .... '07	5 00		Hoffmann, George F. .... '07	5 00	
Hall, Joseph P. .... '07	5 00		Hoffmann, George L. .... '07	5 00	
Hall, William A. .... '07	5 00		Hoffmann, George W. .... '07	5 00	
Hallberg, Carl S. N. .... '07	5 00		Hogaboom, George A. .... '07	5 00	
Hallaway, Robert R. .... '07	5 00		Holliday, Francis E. .... '07-'08	10 00	
Halstead, Alice L. .... '08	5 00		Holloway, Jesse D. .... '07	5 00	
Hamann, William A. .... '07-'08	10 00		Holm, Marinus L. .... '07-'08	10 00	
Hammar, Alrick .... '08	5 00		Holmes, Henry E. .... '08	5 00	
Hamner, James F. .... '07	5 00		Holt, Edwin M. .... '07	5 00	
Hance, Anthony M. .... '07-'08	10 00		Holt, Lewis H., Jr. .... '07	5 00	
Haney, Thomas C. .... '07-'08	10 00		Holzhauser, Charles W. .... '07-'08	10 00	
Hankey, William T. .... '08	5 00		Hood, William D. .... '08	5 00	
Hannan, Owen B. .... '07	5 00		Hook, James P. .... '08	5 00	
Harbaugh, Wilson L. .... '07	5 00		Hoover, George W. .... '07	5 00	
Harbold, John T. .... '07-'08	10 00		Hopkins, Jesse L. .... '08	5 00	
Hardin, John H. .... '04-'05-'06-'07	20 00		Hopp, Lewis C. .... '07	5 00	
Harding, George A. .... '07	5 00		Horlick, Alexander J. .... '08	5 00	
Harkany, Samuel .... '07	5 00		Horn, Wilbur F. .... '07	5 00	
Harrington, Michael T., Jr. .... '08	5 00		Horton, Charles H. .... '06-'07	10 00	
Harrison, Robert L. .... '06-'07	10 00		Houghton, E. Mark. .... '07	5 00	
Harter, Isaac F. .... '07	5 00		Hover, William A. .... '07-'08	10 00	
Hartigan, Joseph D. .... '07	5 00		Howard, Mrs. Fletcher. .... '07	5 00	
Harting, Rudolph R. .... '08	5 00		Howard, Henry. .... '07	5 00	
Hartz, J. D. August. .... '08	5 00		Howard, Sam A. .... '07	5 00	
Haschenburger, F. O. .... '07-'08	10 00		Howell, Edward V. .... '06-'07	10 00	
Hassett, Thomas B. .... '07-'08	10 00		Howson, Arthur B. .... '08	5 00	
Hassinger, Sam'l E. R. .... '08	5 00		Hoyt, George M. .... '07	5 00	
Hatcher, Robert A. .... '08	5 00		Hubbard, Fred. A. .... '07-'08	10 00	
Hutton, Elmore W. .... '07-'08	10 00		Huder, Henry J. .... '08	5 00	
Hauenstein, William .... '07	5 00		Hudson, Arthur .... '07-'08	10 00	
Haussmann, Henry L. .... '07-'08	10 00		Huested, Alfred B. .... '07	5 00	
Haussmann, Fred'k W. .... '07	5 00		Hughes, Francis S. .... '08	5 00	
Havenhill, L. D. .... '07-'08	10 00		Huhn, Charles H. .... '07	5 00	
Hay, Charles L. .... '07	5 00		Hull, Ralph W. .... '07-'08	10 00	
Hay, Edward A. .... '07-'08	10 00		Hummel, John A. .... '08	5 00	
Haymaker, Frank B. .... '07	5 00		Humphreys, Charles J. .... '07	5 00	
Amount carried forward .....	\$2945 00	\$48 50	Amount carried forward .....	\$3425 00	\$43 50

	Annual Dues.	Certificate.		Annual Dues.	Certificate.
Amount brought forward.....	\$3425 00	\$53 50	Amount brought forward.....	\$3850 00	\$53 50
Hunsberger, Ambrose.....	08	5 00	Kleine, Oscar C., Jr.....	07	5 00
Hunt, Byrd H.....	07	5 00	Klenze, William T.....	07	5 00
Hunt, Reid.....	07	5 00	Klie, G. H. Charles.....	07	5 00
Hunter, Angus.....	08	5 00	Kliemad, George.....	07	5 00
Huntley, Clyde G.....	08	5 00	Kline, Clarence M.....	08	5 00
Hurd, John C.....	08	5 00	Kline, Mahlon N.....	08	5 00
Hurlerbaas, George W.....	07	5 00	Knabe, Gustavus A.....	07	5 00
Hurley, Horace O.....	07-08	10 00	Kniseley, Herman D.....	07	5 00
Hurty, John N.....	07	5 00	Knoche, William P.....	08	5 00
Hynson, Henry P.....	08	5 00	Knoebel, Percy T.....	07-08	10 00
Ilhardt, William K.....	07	5 00	Knoebel, Thomas.....	08	5 00
Iltis, George W.....	08	5 00	Knowlton, George H.....	07-08	10 00
Ink, Charles E.....	06-07	10 00	Knox, James W. T.....	08	5 00
Irvine, Ephraim D.....	08	5 00	Knox, Steven D.....	07	5 00
Isakovics, Alois von.....	08	5 00	Koch, August F.....	07-08	10 00
Ittner, William F.....	07	5 00	Koch, Christopher.....	07	5 00
Jackson, Charles H.....	07	5 00	Koch, Fred. C.....	07-08	10 00
Jackson, Samuel R.....	07	5 00	Koch, Julius A.....	08	5 00
Jamieson, George A.....	07	5 00	Koch, William J.....	07-08	10 00
Janssen, Jacob S.....	07	5 00	Koegel, Herman H.....	07	5 00
Jeffrey, Frank D.....	07-08	10 00	Koelle, Otto C.....	07	5 00
Jehlik, Anton J.....	08	5 00	Kolsch, Julius.....	07	5 00
Jennings, Algernon C.....	07	5 00	Koss, Frank.....	07	5 00
Joergenson, Sophus.....	07	5 00	Krassnosky, Samuel.....	07	5 00
Johnson, Charles W.....	08	5 00	Kraus, Otto.....	07-08	10 00
Johnson, Manuel.....	07	5 00	Kreizinger, Karl L.....	07-08	10 00
Johnson, Marcy M.....	07	5 00	Krejci, Leo C.....	07-08-09	15 00
Johnstone, J. C.....	07	5 00	Krembs, Ernest M.....	07-08	10 00
Jones, David F.....	06-07	10 00	Kremers, Edward.....	08	5 00
Jones, James T.....	07	5 00	Krul, John G.....	07	5 00
Jones, Oscar W.....	07	5 00	Krvavica, Antony.....	07	5 00
Jones, Philip M.....	07	5 00	Kuder, William F.....	07	5 00
Jones, Thomas W.....	07	5 00	Kurtz, Irving W.....	06-07	10 00
Jongh, Pedro de.....	07	5 00	Kutchbauch, John F.....	08	5 00
Jorden, Henry A.....	07	5 00	Kutscher, George W.....	06	5 00
Josenhans, Reinhardt C. J.....	07	5 00	La Grange, John V.....	08	5 00
Judge, Charles R.....	07	5 00	La Pierre, Elie H.....	08	5 00
Judson, Arthur F.....	07-08	10 00	La Wall, Charles H.....	08	5 00
Jungk, Walter A.....	07	5 00	La Wall, Millicent R.....	08	5 00
Kaemmerer, Wm. F.....	07	5 00	Lacey, William H.....	07-08	10 00
Kahn, Solomon K.....	07	5 00	Lackenbach, Fred'k I.....	07	5 00
Kaiser, Herman W.....	07	5 00	Lackey, Richard H.....	07-08	10 00
Kalish, Oscar G.....	07	5 00	Ladakis, Triantaphyllo.....	08	5 00
Kalkman, Henry A.....	07	5 00	Ladish, Erich H.....	08	5 00
Kalusowski, Henry E.....	07	5 00	Lamar, William R.....	07-08	10 00
Kantrowitz, Hugo.....	07	5 00	Lamm, Edward L.....	07	5 00
Karg, George.....	07	5 00	Lampa, Robert R.....	07	5 00
Kassulke, August.....	07	5 00	Land, Robert H., Jr.....	07	5 00
Katz, Gustave.....	08	5 00	Lantz, William H.....	08	5 00
Katz, Otto.....	07	5 00	Larrabee, Charles W.....	07	5 00
Kauffman, George B.....	07-08	10 00	Larsen, Lars P.....	08	5 00
Kebler, Lyman F.....	07	5 00	Larson, Martin.....	07	5 00
Kelley, Reuben B.....	06-07	10 00	Lascoff, J. Leon.....	07	5 00
Kelly, E. Frank.....	07	5 00	Latham, Thomas.....	07	5 00
Kemp, Edward.....	08	5 00	Laton, William L.....	08	5 00
Kempf, Fred. F.....	07	5 00	Laue, John M. A.....	08	5 00
Kent, Henry A.....	07	5 00	Lawrence, Harry H.....	07-08	10 00
Kephart, Philip.....	07	5 00	Le Richeux, Alfred C.....	07	5 00
Kercher, Edwin H.....	07-08	10 00	Leavitt, Adoniram J.....	08	5 00
Kester, Joseph A.....	07	5 00	Leber, J. Gilbert.....	07-08	10 00
Ketchum, James S.....	07-08	10 00	Lee, Richard H.....	07	5 00
Kettler, Edward, Jr.....	07-08	10 00	Lee, William E.....	08	5 00
Kiedaisch, George A.....	07	5 00	Leeb, Theodore F.....	07	5 00
Kimberly, Charles H.....	08	5 00	Leet, Robert A.....	07	5 00
King, George A. N.....	07	5 00	Leftwich, Harry P.....	07	5 00
King, Jacob H. C.....	07	5 00	Legel, John G.....	07	5 00
Kirchgasser, William C.....	08	5 00	Legendre, Joseph A.....	06	5 00
Kirk, Frank H.....	07	5 00	Lehman, Charles W.....	07	5 00
Kirk, Samuel B.....	07	5 00	Lehman, Louis.....	07	5 00
Kirkland, Derwentwater.....	07	5 00	Leitch, James C.....	07	5 00
Kisker, Frederick W.....	07	5 00	Lemasters, William O.....	08	5 00
Kistner, Otto E.....	07	5 00	Lembke, Carl H. F.....	07	5 00
Klein, Edward N. E.....	08	5 00	Lemly, Charles C.....	07	5 00
Klein, Ernest F.....	08	5 00	Letzler, Axel E.....	07-08	10 00
Klein, Nicholas.....	07	5 00	Leverly, John A.....	07	5 00
Amount carried forward.....	\$3850 00	\$53 50	Amount carried forward.....	\$4310 00	\$58 50

	Annual Dues.	Certificates.
Amount brought forward.....	\$4310 00	\$58 50
Levinson, Joseph.....	10 00	
Levy, William M.....	5 00	
Lewis, Ernest G.....	10 00	
Lichthardt, Geo. H. P.....	5 00	
Lillich, Bert A.....	5 00	
Lillie, Forrest B.....	5 00	
Lilly, Eli.....	5 00	
Lilly, Josiah K.....	5 00	
Lindly, John M.....	5 00	
Lindsay, R. Audley.....	5 00	
Lindvall, Gus.....	5 00	
Lo Gardo, Antonio.....	5 00	
Loertz, Carl E.....	5 00	
Lohmann, John.....	5 00	
Lordier, Charles J.....	5 00	
Loussarian, A. H.....	5 00	
Lowe, Clement B.....	5 00	
Lowell, Edward M.....	5 00	
Lowry, William J., Jr.....	5 00	
Ludwig, William E.....	10 00	
Lueder, Fritz.....	5 00	
Lusby, William H.....	5 00	
Lynn, Charles J.....	5 00	
Lyon, George C.....	5 00	
Lyons, Lucien E.....	5 00	
Maddowell, Wm. F.....	5 00	
Machenheimer, Don G.....	10 00	
Maggio, James I.....	5 00	
Maguire, Edward S.....	5 00	
Maisch, Henry.....	5 00	
Major, John R.....	5 00	
Mallard, A. E.....	5 00	
Mann, Charles F.....	5 00	
Mansfield, Samuel.....	5 00	
Mansfield, William.....	5 09	
Mares, Frank M.....	10 00	
Marion, Etienne J.....	5 00	
Marsden, Josh F.....	10 00	
Martin, Harry.....	5 00	
Martin, John F.....	10 00	
Martin, Nicholas H.....	5 00	
Martin, William R.....	5 00	
Martinez, Alfred.....	5 00	
Mason, Ernest L.....	5 00	
Mason, Harry B.....	5 00	
Mason, Myron R.....	5 00	
Mathison, Soren.....	10 00	
Matthews, Charles E.....	5 00	
Matusow, Harry.....	5 00	
May, Charles C.....	5 00	
Mayer, Joseph L.....	5 00	
Mayer, Peter.....	5 00	
McArthur, James W.....	5 00	
McBride, Charles R.....	5 00	
McCartney, Frank L.....	5 00	
McCauley, Charles E.....	5 00	
McClerkin, Felix W.....	5 00	
McClugage, John J.....	5 00	
McClure, Clarence M.....	5 00	
McConaughy, Thomas G.....	5 00	
McConnell, Chas. H.....	5 00	
McConnell, Lewis W.....	5 00	
McComomy, Paul L.....	5 00	
McCoy, James E.....	5 00	
McElhenie, Thomas D.....	5 00	
McFerren, J. D.....	5 00	
McGee, George.....	5 00	
McGill, John T.....	5 00	
McIntyre, Ewen.....	5 00	
McKay, Felix E.....	5 00	
McKenna, Harry A.....	5 00	
McKesson, Donald.....	5 00	
McKesson, G. Clinton.....	5 00	
McKinney, Robert S.....	5 00	
McNair, John S.....	5 00	

Amount carried forward..... \$4725 00 \$58 50

	Annual Dues.	Certificates.
Amount brought forward.....	\$4725 00	\$58 50
McNeil, Robert.....	5 00	
McQuillen, Francis.....	5 00	
Meadows, Asbury W.....	5 00	
Meissner, Frederick W., Jr.....	10 00	
Meixner, Fred M. F.....	10 00	
Menk, Charles W.....	10 00	
Meredith, H. Lionel.....	10 00	
Merrell, George R.....	10 00	
Mertz, Edward L.....	5 00	
Meserve, Albert W.....	5 00	
Metz, Abraham L.....	20 00	
Metzger, Matthias C.....	10 00	
Meyer, Adolph C.....	5 00	
Meyer, Charles L.....	10 00	
Meyer, Frederick H.....	5 00	
Meyer, Theodore F.....	5 00	
Michaelis, Gustavus.....	5 00	
Millard, David R.....	10 00	
Millener, William S.....	5 00	
Miller, Albert.....	5 00	
Miller, Charles.....	5 00	
Miller, Charles E.....	10 00	
Miller, Emerson R.....	5 00	
Miller, Frederick J.....	5 00	
Miller, F. William.....	5 00	
Miller, Jacob A.....	5 00	
Miller, T. Ashby.....	5 00	
Mills, George P.....	5 00	
Miner, Maurice A.....	5 00	
Mittemiler, John A.....	5 00	
Mittelbach, William.....	5 00	
Moerk, Frank X.....	5 00	
Monaghan, Thomas F.....	5 00	
Monsabert, Arthur C. de.....	5 00	
Moore, John T.....	10 00	
Moore, Silas H.....	10 00	
Moore, Thomas H.....	10 00	
Morales, Celestino G.....	5 00	
Morgan, Aylmer L.....	5 00	
Morgan, Frank E.....	10 00	
Morgan, Thomas J.....	5 00	
Morrin, Ludger J.....	10 00	
Morris, Max.....	15 00	
Morris, Richard G.....	5 00	
Morrison, George S.....	5 00	
Morse, Frank D.....	5 00	
Mosher, William W.....	5 00	
Motter, Murray Galt.....	5 00	
Moxley, Roland R.....	5 00	
Moya, Carlos A.....	5 00	
Moyer, Ray P.....	5 00	
Muchnis, Adolph M.....	10 00	
Mueller, Ambrose.....	10 00	
Mueller, J. George.....	5 00	
Mueller, Otto E.....	10 00	
Muench, William.....	5 00	
Muir, William.....	5 00	
Mulford, Henry K.....	5 00	
Murray, Alexander.....	10 00	
Muth, George G.....	5 00	
Muth, George L.....	5 00	
Muth, John C.....	5 00	
Muth, John S.....	5 00	
Myers, Carvosso O.....	5 00	
Myers, Charles J.....	10 00	
Myers, Preston B.....	5 00	
Mygdal, Thorkil.....	5 00	
Neal, Charles C.....	5 00	
Neal, Charles W.....	5 00	
Neal, Thomas L.....	5 00	
Nebig, William G.....	5 00	
Needham, Robert H.....	5 00	
Neeley, Guy M.....	5 00	
Nelligar, Frederick D.....	5 00	
Nelson, Edwin H.....	5 00	

Amount carried forward..... \$5220 00 \$58 50



	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward .....	\$5220 00	\$58 50	Amount brought forward .....	\$5675 00	\$63 50
Newcomb, Edwin L. .... '07	5 00		Pile, Gustavus ..... '06-'07-'08	15 00	
Newlon, Howard M. .... '07	5 00		Pirie, Alfred M. .... '07-'08	10 00	
Newton, Clarke H. W. .... '07	5 00		Pitt, John R. .... '07	5 00	
Newton, R. Albro. .... '08	5 00		Placak, Harry ..... '08	5 00	
Niece, Frederick E. .... '07	5 00		Plaut, Albert. .... '08	5 00	
Nielson, John ..... '08	5 00		Poehner, Adolf A. .... '07	5 00	
Niethammer, Otto F. .... '06-'07	10 00		Poley, Warren H. .... '07	5 00	
Nitardy, Ferdinand. .... '07	5 00		Pollard, Augustus T. .... '07	5 00	
Nixon, Charles F. .... '08	5 00		Porter, Chilton S. .... '07	5 00	
Noll, Martin J. .... '07	5 00		Porter, William H. .... '07	5 00	
Noll, Mathias ..... '07	5 00		Posey, Henry G. .... '06	5 00	
Norton, George E. .... '08	5 00		Potter, Herschel E. .... '07-'08	10 00	
O'Connell, Charles J. .... '07	5 00		Potter, Maynard H. .... '07-'08	10 00	
O'Gorman, Theophilus V. .... '08	5 00		Potts, David G. .... '08	5 00	
O'Hare, James ..... '08	5 00		Potts, Thomas H. .... '07-'08	10 00	
O'Leary, James P. .... '07	5 00		Prall, Delbert E. .... '08	5 00	
O'Neil, Henry M. .... '08	5 00		Pratt, Thomas M. .... '07	5 00	
Oettinger, Albert ..... '08	5 00		Price, Charles H. .... '08	5 00	
Ogier, William R. .... '07-'08	10 00		Price, Joseph ..... '08	5 00	
Oglesby, George D. .... '07	5 00		Prior, Toney ..... '07	5 00	
Ohliger, Willard ..... '07	5 00		Puckner, William A. .... '08	5 00	
Oldberg, Oscar ..... '08	5 00		Puig, Juan E. .... '07	5 00	
Oliver, Frank M. .... '07	10 00		Quackinbush, Benj. F. .... '08	5 00	
Oliver, William M. .... '07-'08	10 00		Queeny, John F. .... '08	5 00	
Oliveros, Sidney A. .... '07	5 00	5 00	Quigley, Richard L. .... '07	5 00	
Orton, Ingomar F. .... '08	5 00		Quin, Frank W. .... '05-'06	10 00	
Osborne, Melmoth M. .... '07-'08	10 00		Quirk, Edmund C., Jr. .... '07	5 00	
Oseward, Cornelius ..... '07-'08	10 00		Kabak, Frank ..... '07	5 00	
Ottinger, James J. .... '08	5 00		Raeuber, Edward G. .... '07-'08	10 00	
Otto, Theodore G. E. .... '08	5 00		Ramsaur, David W. .... '06-'07	10 00	
Overbeck, Bernard H., Jr. .... '08	5 00		Ramsdell, Clifford ..... '07	5 00	
Overstreet, William P. .... '08	5 00		Ramsey, George ..... '07-'08	10 00	
Overton, Burr M. .... '08	5 00		Rand, Daniel M. .... '05-'06-'07	15 00	
Owen, Frank D. .... '07	5 00		Randall, Frank O. .... '07	5 00	
Pachali, Theodore, Jr. .... '08	5 00		Rapport, George L. .... '07	5 00	
Packard, C. Herbert ..... '07-'08	10 00		Raubenheimer, Otto ..... '08	5 00	
Paddock, Morris V. .... '07	5 00		Rauff, U. Gilbert ..... '07	5 00	
Padrone, Thomas ..... '07	5 00		Rauschkolb, John ..... '07-'08	10 00	
Palmer, J. Dabney ..... '08	5 00		Redsecker, Jacob H. .... '08	5 00	
Parisen, George W. .... '06-'07	10 00		Reed, Willoughby, H. .... '07-'08	10 00	
Parker, Frederick M. .... '07	5 00		Reese, David J. .... '08	5 00	
Partridge, Frank R. .... '07	5 00		Rehfuss, Charles ..... '08	5 00	
Patch, Edgar L. .... '07	5 00		Reilly, Robert C. .... '08	5 00	
Patch, James A. .... '07	5 00		Reimann, George ..... '07	5 00	
Patterson, Charles M. .... '08	5 00		Reuter, Walter H. .... '07-'08	10 00	
Patterson, Charles W. .... '07	5 00		Reyer, Emil ..... '07	5 00	
Patterson, George O. .... '07	5 00		Rhode, Rudolph E. .... '07	5 00	
Patton, John F. .... '07-'08	10 00		Rich, W. Pitt ..... '08	5 00	
Pauley, Frank C. .... '07	5 00		Richardson, Frank ..... '07	5 00	
Peacock, Bertha L. .... '07-'08	10 00		Richardson, Horatio S. .... '07-'08	10 00	
Peacock, Josiah C. .... '07-'08	10 00		Richardson, Samuel W. .... '07	5 00	
Pearce, Howard A. .... '07	5 00		Richardson, Willard S. .... '07	5 00	
Pearre, Howard A. .... '07	5 00		Richtmann, William O. .... '07-'08	10 00	
Pearre, Albert L. .... '07	5 00		Riddell, Benjamin F. .... '07-'08	10 00	
Pearson, Joseph F. .... '08	5 00		Riegel, Samuel J. .... '07-'08	10 00	
Pease, Autumn V. .... '08	5 00		Ries, Herman W. .... '07	5 00	
Pedigo, Smith C. .... '07-'08	10 00		Riley, Cassius M. .... '07-'08	10 00	
Pedroso, Manuel ..... '07	5 00		Riley, Russell ..... '07	5 00	
Pelz, Charles T. .... '07	5 00		Rippetoe, John R. .... '07	5 00	
Perdue, William L. .... '07	5 00		Ritter, Clyde ..... '07	5 00	
Perry, Frank V. .... '07	5 00		Roach, Jeremiah T. .... '07	5 00	
Perry, Frederick W. R. .... '07-'08	10 00		Robertson, Felix O. .... '07	5 00	
Peter, Minor C. .... '08	5 00		Robertson, William F. .... '07	5 00	
Peters, Henry A. .... '07	5 00		Rockefeller, Howard ..... '07-'08	10 00	
Petersheim, John F. .... '07	5 00		Rodemoyer, William E. .... '07	5 00	
Petsche, Bismarck Wm. .... '07	5 00		Roe, John T. .... '07	5 00	
Pettersen, Ernst W. .... '07-'08	10 00		Roehrig, Albert M. .... '07	5 00	
Pfaff, Edward F. .... '07	5 00		Roemer, Frederick ..... '07	5 00	
Pfaff, Henry, Jr. .... '07	5 00		Rogers, Arthur H. .... '07	5 00	
Phliger, Henry C. .... '06-'07	10 00		Rogers, Edward ..... '07-'08	10 00	
Philip, Waldemar B. .... '07	5 00		Rogers, Ora L. .... '07	5 00	
Pieck, Edward L. .... '07-'08	10 00		Rohr, Arthur von ..... '08	5 00	
Pierce, Fred ..... '06	5 00		Rommel, Hans C. .... '07	5 00	
Pierce, William H. .... '07-'08	10 00		Rosenberg, Samuel S. .... '07-'08	10 00	
Pieskirwitz, W. .... '08	5 00		Rosengarten, George D. .... '07-'08	10 00	
Amount carried forward .....	\$5675 00	\$63 50	Amount carried forward .....	\$6170 00	\$63 50

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward.....	\$6170 00	\$63 50	Amount brought forward.....	\$6625 00	\$63 50
Rosenthal, David A.....'08	5 00		Schroeter, Herman N.....'07	5 00	
Rosenzweig, Benjamin.....'08	5 00		Schubert, John J.....'07	5 00	
Rothwell, Walter.....'07-'08	10 00		Schueller, Frederick W.....'07-'08	10 00	
Rounds, Marvin B. C.....'07	5 00		Schuh, Paul G.....'08	5 00	
Roush, Frederick A.....'08	5 00		Schultz, John J.....'08	5 00	
Rowlinski, Robert A.....'07	5 00		Schulz, Henry L.....'07	5 00	
Roziene, Robert P. M.....'07	5 00		Schulz, Raymond.....'07	5 00	
Rudder, William H.....'07	5 00		Schulze, Louis.....'07	5 00	
Ruddiman, Edsel A.....'07-'08	10 00		Schumann, Otto G.....'08	5 00	
Ruenzel, Henry G.....'07-'08	10 00		Schwartz, Maurice P.....'07	5 00	
Ruesch, William E.....'07	5 00		Schweinfurth, George E.....'07-'08	10 00	
Ruhl, Harry F.....'07-'08	10 00		Scofield, J. Walker.....'07	5 00	
Russell, Hamilton.....'08	5 00		Scopp, Otto.....'07	5 00	
Rust, Schuyler S.....'08	5 00		Scott, Alexander W.....'07-'08	10 00	
Ryan, Ambrose E.....'07	5 00		Scott, Henry.....'07-'08	10 00	
Ryan, Frank G.....'08	5 00		Scott, William H.....'08	5 00	
Ryder, Horace F.....'07	5 00		Scoville, Wilbur L.....'08	5 00	
Ryder, Lewis W.....'07	5 00		Seaman, Frederick A.....'08	5 00	
Saalbach, Lewis.....'08	5 00		Searby, William M.....'07	5 00	
Sacks, Bernard.....'07	5 00		Sears, Charles B.....'08	5 00	
Sala, Albert F.....'06-'07	10 00		Sears, Joseph E.....'07	5 00	
Sale, Howard M.....'07	5 00		Seaverns, Martha G.....'06-'07-'08	15 00	
Sahn, Louis N.....'08	5 00		Seidell, Atherton.....'07	5 00	
Sample, Oliver H.....'07	5 00		Seinsoth, John J.....'07	5 00	
Samson, Max.....'08	5 00		Setz, Lorenz A.....'08	5 00	
Sanford, John F.....'05-'06-'07	15 00		Seltzer, Leonard A.....'07	5 00	
Sarra, Ernesto.....'07	5 00		Selzer, Eugene R.....'08	5 00	
Sass, Stephen K.....'08	5 00		Sennewald, Emil A.....'08	5 00	
Sauerbrun, Otto.....'07-'08	10 00		Serodimo, Herman.....'08	5 00	
Sauvinet, Charles D.....'08	5 00		Seymour, James.....'06-'07	10 00	
Sawyer, Hilton H.....'07	5 00		Shaak, Franklin P.....'08	5 00	
Sawyer, John R.....'08	5 00		Sharp, Sol A.....'07	5 00	
Sayers, Milton C.....'07	5 00		Sheehan, John S.....'07	5 00	
Sayre, Edward A.....'07	5 00		Sherman, Charles R.....'08	5 00	
Sayre, Lucius E.....'08	5 00		Sherrard, Charles C.....'07	5 00	
Schaak, Milton F.....'07	5 00		Sherriff, William E.....'07	5 00	
Schachleiter, Francis G.....'07	5 00		Sherwood, Henry J.....'07-'08	10 00	
Schadt, Conrad.....'08	5 00		Shimer, Samuel M.....'08	5 00	
Schaefer, Emil A.....'08	5 00		Shoemaker, Clayton F.....'08	5 00	
Schaffer, Charles.....'06-'07	10 00		Shudrowitz, Frank S.....'07	5 00	
Schaper, Henry F.....'06	5 00		Shurtleff, Wilford C.....'07	5 00	
Scheips, Theodor I.....'07-'08	10 00		Siegenthaler, Harvey N.....'07	5 00	
Schenck, Henry.....'08	5 00		Siegfried, Henry J.....'07	5 00	
Schenk, Fannie K.....'07	5 00		Siegfried, Howard J.....'07	5 00	
Scherer, Andrew.....'08	5 00		Siephin, Charles A.....'07	5 00	
Scheuber, Frank A.....'08	5 00		Sievers, Arthur.....'07	5 00	
Schieffelin, Wm. J.....'07-'08	10 00		Simmons, Frank B.....'05-'07-'08	15 00	
Schimmel, Maurice S.....'07	5 00		Simmons, Gustav F.....'07	5 00	
Schimpf, Henry W.....'07-'08	10 00		Simon, Frank.....'07	5 00	
Schlabach, Edward J.....'07	5 00		Simon, William.....'08	5 00	
Schleussner, Charles F.....'08	5 00		Simson, Francis C.....'07	5 00	
Schlosser, Peter.....'08	5 00		Slade, Harry A.....'08	5 00	
Schlotterbeck, Augustus G.....'08	5 00		Slauson, John G.....'07	5 00	
Schlotterbeck, Julius O.....'07-'08	10 00		Sloss, Robert A.....'08	5 00	
Schlup, Samuel Jr.....'08	5 00		Smith, Albert B.....'07	5 00	
Schmidt, Henry.....'07	5 00		Smith, Albert H.....'07	5 00	
Schmidt, F. Joseph.....'07-'08	10 00		Smith, Clarence P.....'07	5 00	
Schmidt, Frederick M.....'08	5 00		Smith, F. A. Upsher.....'07	5 00	
Schmidt, Henry.....'08	5 00		Smith, Harley E.....'07	5 00	
Schmidt, Valentine.....'07	5 00		Smith, Lauriston S.....'08	5 00	
Schmidt, Walter K.....'08	5 00		Smith, Linville H.....'07-'08	10 00	
Schmitt, John J.....'08	5 00		Smith, Rufus E.....'07	5 00	
Schmitter, Jonathan.....'07	5 00		Smith, Theodric.....'07	5 00	
Schneck, Charles.....'07	5 00		Smith, Walter V.....'08	5 00	
Schneider, Benjamin.....'07	5 00		Smiteman, Chas. C.....'06-'07-'08	15 00	
Schneider, Carl H.....'07	5 00		Snodgrass, Latta K.....'07-'08	10 00	
Schneil, Harry J.....'07-'08	10 00		Snow, Charles W.....'08	5 00	
Schoenhut, Christie H.....'08	5 00		Snow, Clyde M.....'07	5 00	
Schoettlin, Albert J.....'08	5 00		Snow, Herbert W.....'07	5 00	
Scholastica, Sister Mary.....'07	5 00		Sohrbeck, G. Henry.....'08	5 00	
Scholz, William F.....'08	5 00		Schrbeck, George W.....'08	5 00	
Schrank, C. Henry.....'07-'08	10 00		Solomons, Isaiah A.....'08	5 00	
Schreiber, August.....'07	5 00		Sombart, John E.....'07	5 00	
Schreiner, Robert.....'08	5 00		Sords, Thomas V.....'07	5 00	
Schrodt, Jacob.....'07	5 00		Soult, Roy M.....'08	5 00	
Amount carried forward.....	\$6625 00	\$63 50	Amount carried forward.....	\$7070 00	\$63 50

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward.....	\$7070 00	\$63 50	Amount brought forward.....	\$7555 00	\$63 50
Southard, Frank A.....	07 5 00		Tobin, John M.....	07 5 00	
Spalding, Warren A.....	08 5 00		Todd, Albert M.....	07 5 00	
Spangler, Lewis C.....	07 5 00		Topping, Arthur E.....	08 5 00	
Sparks, James M.....	07 5 00		Torbert, Willard H.....	08 5 00	
Speer, Charles C.....	07-08 10 00		Toulson, Milbourne A.....	08 5 00	
Spencer, James W.....	08 5 00		Tracy, Kenneth W.....	07 5 00	
Spiegel, Adolph.....	07-08 10 00		Traynor, Chas. F.....	06-07-08 15 00	
Spordli, Ernest.....	06-07-08 15 00		Treat, Joseph A.....	08 5 00	
Sprague, Weason G.....	08 5 00		Treber, Frederick W.....	07-08 10 00	
Spring, George A.....	07 5 00		Tripp, Arthur H.....	07-08 10 00	
Squibb, Charles F.....	07 5 00		Trout, John H.....	07 5 00	
Stacy, Marion F.....	07-08 10 00		Troxler, Constantine, Jr.....	08 5 00	
Stachle, Louis L.....	07 5 00		Troxler, Robert F.....	06-07 10 00	
Stahel, Albert W.....	07 5 00		Truax, Charles.....	07-08 10 00	
Stanford, William H.....	07-08 10 00		True, Rodney H.....	06-07 10 00	
Stamm, Dante M.....	05-06 10 00		Tuedson, Eric P.....	08 5 00	
Stange, Carl F.....	07 5 00		Tuthill, Frederick P.....	08 5 00	
Staudt, Albert J.....	07 5 00		Tuttle, George O.....	07-08 10 00	
Staudt, Louis C.....	07-08 10 00		Uhlich, Ferdinand G.....	08 5 00	
Stearns, Cletus O.....	07 5 00		Umenhofer, Adolph.....	08 5 00	
Stearns, William L.....	06-07-08 15 00		Valdes, Edwardo.....	07 5 00	
Stech, George O.....	08 5 00		Van Aller, Thomas S.....	07 5 00	
Stein, Edward T. N.....	07 5 00		Van Derveer, Robert H.....	08 5 00	
Steinmeyer, William O.....	08 5 00		Van Ness, George I.....	05-06-07 15 00	
Stenbuck, Moses A.....	08 5 00		Van Schaack, Cornelius P.....	08 5 00	
Stephenson, John J.....	07 5 00		Vanderkleed, Charles E.....	07 5 00	
Stevens, Alvis B.....	07 5 00		Varney, Edward F.....	07-08 10 00	
Stevens, Edward.....	07 5 00		Vaughan, Harry W.....	06 5 00	
Stevens, Frederick S.....	08 5 00		Vaughn, Patrick H.....	07 5 00	
Stewart, Ernest E.....	07 5 00		Voegeli, Thomas.....	08 5 00	
Stewart, Francis E.....	07 5 00		Voigt, Joseph F.....	08 5 00	
Steyh, George P.....	07 5 00		Von Stein, John H.....	07 5 00	
Stier, Carl.....	05-06-07 15 00		Voss, Edward, Jr.....	08 5 00	
Stier, George F.....	07 5 00		Voss, George W.....	08 5 00	
Stimson, Charlotte E.....	07 5 00		Voteler, William.....	08 5 00	
Stoddard, Thomas.....	07 5 00		Yowell, Louis S.....	08 5 00	
Stolle, Henry J.....	07-08 10 00		Waddell, Minor T.....	07 5 00	
Stone, Clarence G.....	07 5 00		Wagner, Arthur C.....	07 5 00	
Storer, Charles A.....	07 5 00		Walbrach, Arthur.....	06-07 10 00	
Stort, Samuel T.....	07 5 00		Walbridge, Cyrus P.....	08 5 00	
Stoughton, Dwight G.....	08 5 00		Walker, Alfred.....	07 5 00	
Stout, Marion A.....	08 5 00		Walker, Charles H.....	08 5 00	
Streeper, Frank P.....	07 5 00		Walker, Robert H.....	07 5 00	
Strickland, Franklin N.....	07 5 00		Walker, William A.....	07 5 00	
Stroup, Freeman P.....	08 5 00		Wallace, John C.....	07 5 00	
Strunz, Christopher E.....	08 5 00		Wallhann, Carl G.....	07 5 00	
Sturmer, Julius W.....	07-08 10 00		Walsdorf, Edward H.....	08 5 00	
Sultan, Frederick W.....	07-08 10 00		Walter, Peter G.....	07 5 00	
Sum, Francis.....	07 5 00		Walton, Lucius L.....	07 5 00	
Suppan, Leo K. A.....	07 5 00		Walz, J. Lee.....	08 5 00	
Sweet, Caldwell.....	08 5 00		Wangler, Conrad D.....	08 5 00	
Sweet, William H.....	08 5 00		Ward, A. Jae.....	07-08 10 00	
Symonds, Arthur H.....	07-08 10 00		Ware, Charles H.....	07 5 00	
Taborelli, Ernest T.....	07 5 00		Ware, Clarence W.....	07 5 00	
Takamine, Jokichi.....	08 5 00		Warfield, James A.....	08 5 00	
Taylor, Augustus C.....	07 5 00		Warn, William E.....	08 5 00	
Taylor, Henry L.....	07 5 00		Warner, Francis D.....	05-06-07 15 00	
Taylor, Walter T.....	07 5 00		Warner, Louis H.....	07 5 00	
Teeters, Wilber J.....	08 5 00		Warner, William R., Jr.....	08 5 00	
Tepe, Louis.....	07 5 00		Warren, Lee.....	07 5 00	
Thames, Joseph J.....	07 5 00		Warren, Robert A.....	07 5 00	5 00
Thelander, Chreston C.....	07-08 10 00		Washburn, Homer C.....	07 5 00	
Thomas, Daniel J.....	07 5 00		Wassmann, Louis W.....	07 5 00	
Thomas, John B.....	08 5 00		Watkins, Charles W.....	07 5 00	
Thompson, John R.....	06-07 10 00		Watson, Herbert K.....	07 5 00	
Thompson, Leou A.....	08 5 00		Watson, Joseph R.....	07 5 00	
Thorburn, Albert D.....	08 5 00		Watson, William, Jr.....	07-08 10 00	
Thorn, Henry P.....	08 5 00		Watt, George H.....	07 5 00	
Thum, John K.....	07 5 00		Webb, Edward N.....	07-08 10 00	
Thurston, Edwin J.....	08 5 00		Webber, J. Le Roy.....	08 5 00	
Tielke, Maxwell G.....	07 5 00		Weed, Nelson.....	08 5 00	
Tilton, Claude E.....	06-07-08 15 00		Weicker, Theodore.....	07-08 10 00	
Timberlake, Arthur.....	07 5 00		Weidemann, George B.....	07 5 00	
Timmer, Jacob B.....	06-07 10 00		Weimar, Henry.....	07-08 10 00	
Timmons, George D.....	06-07 10 00		Weinstein, Joseph.....	07 5 00	
Amount carried forward.....	\$7555 00	\$63 50	Amount carried forward.....	\$8025 00	\$68 50

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward.....	\$8025 00	\$68 50	Amount brought forward.....	\$8280 00	\$73 50
Weiser, William P.....'08	5 00		Wilson, William H.....'07	5 00	
Weiss, Emil O.....'07-'08	10 00		Wimmer, Curt P.....'07	5 00	
Weller, Frank P.....'07	5 00		Winter, James H.....'07	5 00	
Wendel, H. Edward.....'07-'08	10 00		Wirth, Adam.....'08	5 00	
Wendt, William C.....'07-'08	10 00		Wirthman, J. George.....'07	5 00	
Werner Rudolph C.....'07	5 00		Wirthman, Joseph C.....'07-'08	10 00	
Wescott, William C.....'05-'06-'07	15 00		Wittmer, Joseph W.....'07	5 00	
West, Charles A.....'08	5 00		Wolf, Charles A.....'08	5 00	
West, Fred.....'07	5 00	5 00	Wolf, Frank C.....'07-'08	10 00	
Westby, Sever.....'07	5 00		Wolf, J. Carlton.....'08	5 00	
Westcott, James W.....'07	5 00		Wolf, Edward H.....'08	5 00	
Wheeler, A. Alton.....'07	5 00		Wolff, Gustave.....'04-'05-'06	15 00	
Wheeler, Carlton B.....'08	5 00		Wood, Alonzo F., Jr.....'08	5 00	
Wheeler, William D.....'06-'07	10 00		Wood, Horatio C., Jr.....'07	5 00	
Whilden, Charles B.....'07	5 00		Wood, James P.....'08	5 00	
Whipple, George H.....'07-'08	10 00		Wood, John W.....'07-'08	10 00	
White, Albert J.....'07	5 00		Woodman, Walter I.....'08	5 00	
White, Robert C.....'08	5 00		Woodworth, Benj. S.....'07-'08	10 00	
White, Robin H.....'07-'08	10 00		Woodworth, Chas. B.....'07-'08	10 00	
Whitney, David V.....'07	5 00		Wooten, Thomas V.....'07	5 00	
Whittle, William A.....'08	5 00		Wooyenaka, Keizo.....'07-'08	10 00	
Wichelns, Frederick.....'05-'06	10 00		Wrensch, Henry E., Jr.....'07-'08	10 00	
Wicks, Otto.....'07	5 00		Wright, Charles L.....'07	5 00	
Wilcox, Levi.....'08	5 00		Wuenssch, Charles.....'07	5 00	
Wiley, Harvey W.....'07	5 00		Wulling, Frederick J.....'08	5 00	
Wilkes, George R.....'07	5 00		Wulsen, Dietrich H.....'07	5 00	
Willenbrink, Chas. A.....'07	5 00		Wunderlich, Edward.....'07	5 00	
Willets, Charles E.....'07	5 00		Wycoff, Elmer E.....'07	5 00	
Williams, Edward.....'07	5 00		Yeomans, Sidney C.....'07-'08	10 00	
Williams, John K.....'06	5 00		Young, David B.....'08	5 00	
Williams, Richard W.....'08	5 00		Young, George O.....'07	5 00	
Williams, Seward W.....'07	5 00		Young, Harry G.....'07	5 00	
Williamson, Wyley P.....'07	5 00		Zabaldano, Alexander.....'07	5 00	
Willis, Henry.....'05-'06-'07	15 00		Zamora, Emanuel.....'08	5 00	
Willman, William G.....'08	5 00		Zelinski, Walter F. von.....'07	5 00	
Willson, George A.....'07	5 00		Ziegler, Howard P.....'07	5 00	
Wilson, Charles F.....'07	5 00		Zottman, William H.....'08	5 00	
Wilson, George B.....'07-'08	10 00		Zuenkeler, J. Ferd.....'08	5 00	
Wilson, George T.....'07	5 00		Zurawski, Narcyz J.....'07	5 00	
Amount carried forward.....	\$8280 00	\$73 50	Totals.....	\$8525 00	\$73 50

## OBITUARY NOTICES.

Name.	Address.	Elected.	Born.	Died.	Preceptor.	College.
Adams, Henry	Springfield, Mass.	1904	June 14, 1843	October 8, 1907.		
Anderson, Samuel	Bath, Me.	1876	September 7, 1835	June 10, 1908.		
Andriessen, Hugo	Beaver, Pa.	1875	June 14, 1843	April 21, 1908	Frederick Braun.	
Austin, Wm. C.	Painesville, Ohio	1904	July 3, 1850	February 16, 1906	Dr. Simonds, Con- neaut, Ohio.	
Brock, Gustavus E.	San Francisco, Cal.	1905.				
Burke, William H.	Detroit, Mich.	1902	September 28, 1865	December 17, 1907	J. J. Goodyear	Dept. of Phar., Univ. of Mich.
Burrugh, Horace	Baltimore, Md.	1883	June 2, 1845	February 18, 1908.		
Casper, Thomas J.	Springfield, O.	1867		May 7, 1908.		
Corning, Albion J.	Baltimore, Md.	1898	November 7, 1841	August 17, 1907	Prof. Chandler.	
Drescher, August	Newark, N. J.	1905	1849	December 5, 1907	Dr. Louis Drescher.	Philadelphia, C. P.
Emich, Columbus V.	Baltimore, Md.	1863	August 22, 1833	December 12, 1907	James H. Perkins.	
Eyssel, George	Kansas City, Mo.	1889	December 23, 1855	February 17, 1908.		
Field, Claud	Indianapolis, Ind.	1890	February 22, 1867	July 23, 1907	Frank H. Carter	Phil. Coll. of Phar.
Fisk, Frank E.	Chicago, Ill.	1902	February 23, 1860	May 26, 1908	Dr. Haines.	
Gausby, Robert A.	E. Cleveland, O.	1904	July 8, 1876	February 2, 1908	Alexander Stewart	Toronto Coll. of Phar.
Ince, Joseph	London, Eng.	1882.				
Kalish, Julius	New York City	1900		April, 1908.		
Klein, Nicholas	Louisville, Ky.	1907	January 9, 1870	December 29, 1907	Theo. Rectanus.	
Lord, Thomas	Chicago, Ill.	1882	February 2, 1824	1908	Mr. Dyer.	
Lusby, R. H.	Hot Springs, Ark.	1907	February 13, 1856	June 2, 1908.		
Lyon, George C.	Providence, R. I.	1899	September 1, 1856	November 26, 1907	Geo. C. Chickering.	
Miller, Jacob A.	Harrisburg, Pa.	1873	1837	April 27, 1908		Med. Dept., Univ. of Pa.
Riley, Russell	St. Louis, Mo.	1901	1843	March 16, 1908	Norman Spotswood.	
Schmitt, Geo. J. F.	San Antonio, Tex.	1890	March 17, 1859	October 12, 1907	Frederick Kalteyer.	
Schneck, Charles	Hot Springs, Ark.	1907	March 23, 1833	May 14, 1908.		

OBITUARY NOTICES.—*Concluded.*

Name.	Address.	Elected.	Born.	Died.	Preceptor.	College.
Shinn, James T.	Philadelphia, Pa.	1860	January 9, 1834	October 4, 1907	Chas. Ellis & Co.	Phil. Coll. of Phar.
Sombart, John E.	Wilmore, Kan.	1881	April 16, 1859	July 8, 1908	E. Roeschel	Phil. Coll. of Phar., Jefferson Med. Coll.
Stacey, Benjamin F.	Charlestown, Mass.	1860	December 26, 1834	May 13, 1908	H. C. Atwood.	
Timberlake, Arthur	Indianapolis, Ind.	1902	1842	August 13, 1908.		
Voss, George W.	Cleveland, O.	1885	October 10, 1852	August 19, 1908	Mr. Dover.	
Wangler, Conrad D.	Waterloo, Ia.	1876	January 9, 1851	June 7, 1908		Cinn. Coll. of Phar.
Weber, Peter J.	St. Louis, Mo.	1901		May 29, 1907		St. Louis Coll. of Phar.
Wells, Edwin H.	Boston, Mass.	1893	January 22, 1874	August 15, 1907	Geo. F. Ropes	Mass. Coll. of Phar.

# CONSTITUTION AND BY-LAWS

OF THE

# AMERICAN PHARMACEUTICAL ASSOCIATION.

---

## CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians, and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the Council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted

in writing, and may be balloted for at the next Annual Meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

## BY-LAWS.

### CHAPTER I.

#### *Of the Election of Officers.*

ARTICLE I. A Nominating Committee shall be annually chosen, whose duty it shall be annually, at the meeting, to select candidates for the offices of President, three Vice-Presidents and three members of the Council.

ARTICLE II. The Nominating Committee shall submit the names of three persons as candidates for each of the offices of President, First Vice-President, Second Vice-President, Third Vice-President, and three members of the Council. These names are to be submitted by the General Secretary by mail to every member of the Association, together with a request that the member indicate his preference on a ballot enclosed for that purpose, and return the same by mail within one month after the adjournment of the annual meeting.

ARTICLE III. The ballots received as indicated in the preceding article are to be sent by the General Secretary to a Board of Canvassers, composed of three members to be appointed by the President, who in turn shall certify to the General Secretary the result of the election, after which the latter shall be published in the *Bulletin* of the Association.

ARTICLE IV. The officers thus elected by a plurality of the votes cast shall be installed at the final general session of the next annual meeting.

ARTICLE V. The Reporter on the Progress of Pharmacy, the Treasurer and the General Secretary shall be elected annually by the Council.

### CHAPTER II.

#### *Of the President and Vice-Presidents.*

ARTICLE I. The President shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.



ARTICLE V. He shall enforce order and decorum; it is his duty to bear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, not provided for in the By-Laws or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

### CHAPTER III.

#### *Of the General Secretary.*

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary not to exceed \$1200, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general sessions, and carefully preserve, on file, all reports, essays, and papers of every description presented to the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Report of the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act. He shall notify every member at least two weeks in advance of the time and place of each annual meeting.

### CHAPTER IV.

#### *Of the Local Secretary.*

ARTICLE I. The Local Secretary shall reside at or near the place where the next annual meeting of the Association is to be held.

ARTICLE II. He shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists, may be held each year, should the Council so determine, under the direction of the Local Secretary and the Committee on Commercial Interests.

## CHAPTER V.

### *Of the Treasurer.*

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary not to exceed \$750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of \$5,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by two sureties or a Trust Company acceptable to the Council.

## CHAPTER VI.

### *Of the Reporter on the Progress of Pharmacy.*

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary not to exceed \$750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such statistical and biographical notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted, shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting, unless such meeting is held previous to August 1. An introduction or synopsis of the Report is to be presented to the Section on Scientific Papers.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

## CHAPTER VII.

*Of the Council.*

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, to reduce any appropriations that have been made, whenever in their judgment the current receipts are not sufficient to allow the expenditure, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by vote of the Council, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of *ex-officio* members; one member from each local branch of this Association and nine other members, selected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years. None but *ex-officio* members of the Council shall be eligible for reelection thereto until one year after the expiration of their term of office.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, Editor of the Bulletin, the Chairmen of the Sections of the Association, and the Secretary of the Council, shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

Whenever deemed advisable by the Council, it shall after the publication of each edition of the National Formulary appoint a committee of fifteen members from the general membership of the Association, which committee shall have charge of the revision of the Formulary. This committee shall report annually or as often as required to the Council and shall continue to serve until the edition for which it was appointed has been completed. Vacancies occurring in this committee shall be filled by the Council as quickly as is expedient.

ARTICLE VIII. *Section 1.* The Council shall have charge of the revision of the roll and the publication of the Proceedings.

*Section 2.* The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

ARTICLE III. An exhibition of objects interesting to pharmacists, may be held each year, should the Council so determine, under the direction of the Local Secretary and the Committee on Commercial Interests.

## CHAPTER V.

### *Of the Treasurer.*

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary not to exceed \$750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of \$5,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by two sureties or a Trust Company acceptable to the Council.

## CHAPTER VI.

### *Of the Reporter on the Progress of Pharmacy.*

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary not to exceed \$750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such statistical and biographical notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted, shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting, unless such meeting is held previous to August 1. An introduction or synopsis of the Report is to be presented to the Section on Scientific Papers.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

## CHAPTER VII.

*Of the Council.*

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, to reduce any appropriations that have been made, whenever in their judgment the current receipts are not sufficient to allow the expenditure, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by vote of the Council, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of *ex-officio* members; one member from each local branch of this Association and nine other members, selected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years. None but *ex-officio* members of the Council shall be eligible for re-election thereto until one year after the expiration of their term of office.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, Editor of the Bulletin, the Chairmen of the Sections of the Association, and the Secretary of the Council, shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

Whenever deemed advisable by the Council, it shall after the publication of each edition of the National Formulary appoint a committee of fifteen members from the general membership of the Association, which committee shall have charge of the revision of the Formulary. This committee shall report annually or as often as required to the Council and shall continue to serve until the edition for which it was appointed has been completed. Vacancies occurring in this committee shall be filled by the Council as quickly as is expedient.

ARTICLE VIII. *Section 1.* The Council shall have charge of the revision of the roll and the publication of the Proceedings.

*Section 2.* The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

*Section 3.* The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association without first receiving the approval of the Council.

*Section 4.* The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears, one copy of the annual Report of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sessions of the Association and of the Sections, a complete synopsis of the minutes of the Council, the reports of the President and Committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as it may deem worthy of insertion. It shall also fix the price at which the Proceedings may be sold.

## CHAPTER VIII.

### *Of Membership.*

ARTICLE I. Every pharmacist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany, who may be especially interested in Pharmacy and Materia Medica, also editors and publishers of pharmaceutical journals, who, after duly considering the objects of the Association and the obligations of the Constitution and By-laws, subscribe to them, are eligible to membership; provided that any person whose name has been dropped from the roll of members for non-payment of dues may be readmitted after having again made application in regular form, the application being accompanied by the usual fee; or he may be readmitted, without such application, on payment of all back dues; in the latter case his membership shall date from the time when he first joined the Association, as previously printed in the Roll or Members, and notice of such action shall be inserted in the addendum to the Treasurer's report.

ARTICLE II. Every application for membership shall require the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of three-fourths of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By-Laws and paying the annual dues for the current year. Any newly-elected member, upon the payment of the annual dues for the year in which he is elected, shall be entitled to the annual volume of the Proceedings and all publications of the Association that are distributed to its members during the year. Any applications for membership made during the fiscal year viz., between July 1 of one year and July 1 of the following year shall be considered as of the current fiscal year; except that persons applying on or after March 1st shall not be *required* to pay the annual dues for that year, but if they do pay such dues they shall receive all the publications to which members are entitled for the year.

ARTICLE III. Every member shall pay in advance to the Treasurer the sum of *Five Dollars* as his yearly contribution, and by neglecting to pay said contribution for *two successive years* he may be dropped from the Roll.

ARTICLE IV. Any member of the Association who shall pay to the Treasurer the sum of \$100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of \$75.00, or after fifteen years the sum of \$50.00, or after twenty years the sum of \$25.00; and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life-member, and shall be exempt from all future annual contributions.

ARTICLE V. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the annual meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year: Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the roll for non-payment of dues; nor shall any one who has been expelled from the Association be received as a delegate. All credentials shall be sent to the General Secretary *at least two weeks* in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of *Three Dollars* or of *Five Dollars*, to receive from the Treasurer respectively a *paper* or *parchment* certificate of membership signed by the President, one Vice-President, the General Secretary, and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

## CHAPTER IX.

### *Of Meetings and Sessions.*

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, five Sections shall be formed, as follows: 1. Section on Scientific Papers; 2. Section on Commercial Interests; 3. Section on Practical Pharmacy and Dispensing; 4. Section on Pharmaceutical Legislation and Education; 5. Section on Historical Pharmacy.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of Council, act on the report of Council on membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. At the third session the business of the Section on Commercial Interests shall be considered.

ARTICLE VI. At the fourth and fifth sessions the Section on Pharmaceutical Legislation and Education shall consider the business assigned to that Section.

ARTICLE VII. The sixth and seventh sessions shall be devoted to the reading of Scientific Papers and the discussions thereof.

ARTICLE VIII. The eighth and ninth sessions shall be devoted to the subject of Practical Pharmacy and Dispensing.

ARTICLE IX. The tenth session shall be devoted to the subject of Historical Pharmacy.

ARTICLE X. A Chairman and a Secretary shall be elected by ballot by each Section to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE XI. The Chairman of each Section shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the annual meeting.

ARTICLE XII. There shall be elected by each Section a Committee, of which the Chairman of the Section shall be Chairman, to whom shall be delegated the duty of arranging in advance the business to come before the Section at the next annual meeting; these committees in each case becoming Standing Committees of the Association.

ARTICLE XIII. The order of business at the first session of each annual meeting shall be as follows:

*Section 1.* Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

*Section 2.* In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

*Section 3.* Nineteen members shall constitute a quorum for the transaction of business.

*Section 4.* The President's address may then be read, after which the Council shall report the list of properly accredited delegates.

*Section 5.* Reports of Committees shall be presented, read by their titles, synopsis or in full, and laid on the table for future consideration.

*Section 6.* The minutes of the Council shall be read in full at the annual meeting of the Association, and its acts, if approved, shall be sustained by a vote of the majority of the members present; or, if disapproved by a majority of the members present, its acts shall be revised, so as to be acceptable to the Association.

*Section 7.* The President shall call the roll of States, the Territories, District of Columbia and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association, and members of the Council for the ensuing three years: in addition to which the President shall appoint five members from the Association at large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

*Section 8.* Incidental business.

ARTICLE XIV. The order of business at the second general session at each annual meeting shall be as follows:

*Section 1.* The President shall call the Association to order.

*Section 2.* The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

*Section 3.* The Report of the Committee on Nominations shall be read.



*Section 4.* Reading of the Minutes of the Council.

*Section 5.* Reading of the Reports of the Treasurer and General Secretary.

*Section 6.* Reports of Standing Committees shall be read.

*Section 7.* Reports of Special Committees shall be read.

*Section 8.* Incidental business.

*Section 9.* Adjournment subject to the call of the President.

ARTICLE XV. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XVI. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XVII. At the last general session of the Association the newly-elected officers of the Association shall take their respective places.

ARTICLE XVIII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

## CHAPTER X.

### *Of Committees.*

ARTICLE I. There shall be appointed or elected ten Standing Committees as follows: a Committee on the U. S. Pharmacopœia and a Committee on Transportation, each to consist of ten members; a Committee on Time and Place of Meeting, a Committee on Commercial Interests and a Committee on Pharmaceutical Education and Legislation, each to consist of five members; a Committee on Scientific Papers, a Committee on Practical Pharmacy and Dispensing, a Committee on Historical Pharmacy, a Committee on Ebert Prize, and a Committee on General Prizes, each to consist of three members.

ARTICLE II. The Committee on Commercial Interests shall be elected by the Section on Commercial Interests. It shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. It shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE III. The Committee on Scientific Papers shall be elected by the Section on Scientific Papers. It shall arrange the business of the Section, and shall report a number of questions of scientific and practical interest, the answers to which may advance the interests of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person desiring to submit a paper to the Association shall present to the Chairman of the particular Section to which it refers, at least ten days prior to the meeting, an abstract of said paper, indicative of its contents, and consisting of not less than fifty nor more than two hundred words.

This abstract shall be printed as a part of the programme. The paper itself must be submitted to the officers of the Section previous to the first session. Not more than ten minutes shall be allowed for the presentation of any paper, unless by unanimous consent of the Section.

ARTICLE V. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, at the next annual meeting after the

one at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE VI. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE VII. The Committee on Practical Pharmacy and Dispensing, composed of members actually engaged in the retail drug business, shall be elected by the Section on Practical Pharmacy and Dispensing. It shall arrange in advance the business to come before the Section at the next annual meeting. It shall propose a series of subjects for general discussion, and solicit papers on subjects pertaining to the actual practice of pharmacy in retail stores.

ARTICLE VIII. The Committee on Pharmaceutical Legislation and Education, which shall be elected by the Section on Pharmaceutical Legislation and Education, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. It shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year. It shall arrange the business of the Section in advance of its sessions, propose suitable subjects for discussion, and shall attend to such duties as may be delegated to it by the Section. It shall propose each year a subject for discussion at the meetings of the State Associations, and, at the following annual meeting of this Association, shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE IX. The Committee on Historical Pharmacy shall be elected by the Section on Historical Pharmacy. It shall arrange the business of the Section and shall present annually matters of special historical interest in pharmacy. It shall also secure the collection of letters, papers, etc., written by members of the Association, which when so collected shall remain in the custody of the committee and be available for reference to any one interested.

ARTICLE X. The Committee on the United States Pharmacopeia shall be appointed by the President of the Association, as follows: One member to be appointed for ten years and one for nine, eight, seven, six, five, four, three, two and one years respectively, each vacancy occurring by expiration of term to be filled by a new appointment for ten years. The Committee shall elect its own Chairman annually. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopeia. It shall also note errors of any kind found in the U. S. Pharmacopeia, so as to facilitate and aid the work of the National Committee on Revision of the U. S. P.

ARTICLE XI. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul or Minneapolis, Denver and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

## CHAPTER XI.

*Rules of Order and Debate.*

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate. •

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

ARTICLE V. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

## CHAPTER XII.

*Local Branches.*

ARTICLE I. Local branches of this Association may be formed wherever it may appear that twenty-five members of this Association, in good standing, will participate, provided that no more than one such branch shall be formed in any one State, province, district or territory, unless the additional branches shall be formed at a point distant one hundred miles or more from any branch already established in the same State, province, district or territory.

ARTICLE II. All active or voting members of local branches must be members of this Association in good standing.

ARTICLE III. The objects and aims of local branches of this Association shall be the same as set forth in Article I of the Constitution of this body, and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it. And no local branch shall enact any article of Constitution or By-Law in conflict with the Constitution or By-Laws of this Association.

ARTICLE IV. Each local branch having twenty-five active or voting members shall be entitled to elect one member every three years, who shall become and continue a member of the Council of this Association for that time.

## CHAPTER XIII.

*Miscellaneous.*

ARTICLE I. Every proposition to alter or amend these By-Laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

## BY-LAWS OF THE COUNCIL.

---

### CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of the new members of the Council by the Association.

### CHAPTER II.

#### *Of the Chairman and Vice-Chairman.*

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

### CHAPTER III.

#### *Of the Secretary.*

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary not to exceed \$300.

ARTICLE II. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the yeas and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

ARTICLE III. The Secretary of the Council shall also officiate as Secretary of the Committee on Membership.

### CHAPTER IV.

#### *Of Committee on Membership.*

ARTICLE I. The Committee on Membership shall consist of seven members of the Council, to be elected annually by ballot. The General Secretary and the Treasurer of the Association shall be *ex-officio* members of this committee. The committee shall elect its chairman immediately after the election of its members by the Council.

ARTICLE II. The Committee on Membership shall be charged with the duty of keeping a correct list of the members of the Association, and shall present to the Council the list of applicants for membership who have complied with the requirements of the By-Laws of the Association.

ARTICLE III. It shall furnish appropriate biographical sketches of deceased members for publication in the Report of the Proceedings.

## CHAPTER V.

### *Of Committee on Publication.*

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council. Immediately after its election by the Council, the Committee shall elect a Chairman.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Report of the Proceedings.

## CHAPTER VI.

### *Of Committee on Finance.*

ARTICLE I. The Committee on Finance shall consist of three members, who shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

## CHAPTER VII.

### *Of the Centennial Fund.*

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

## CHAPTER VIII.

*Of Sessions.*

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Nine members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman, and the Secretary.
2. Election of the Standing Committees of Council, as follows:
  - a. Committee on Membership, consisting of seven members of the Council, the General Secretary and the Treasurer.
  - b. Committee on Finance, three members.
  - c. Committee on Publication, five members.
  - d. Committee on Centennial Fund, three members.
3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

## CHAPTER IX.

*Miscellaneous.*

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council, or the Chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

## GENERAL RULES OF FINANCE.

ADOPTED 1883, AMENDED 1885, 1887, 1888, 1895, 1900, 1901, 1903.

*First,* The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

*Second,* Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the ~~Chairman~~ of the Council.

*Third,* All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

*Fourth,* The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

*Fifth,* The Chairman of the Council shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council, who shall make an annual report of the same to the Association.

*Sixth,* There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town, the Chairman to be a member of the Finance Committee.

*Seventh,* The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

*Eighth,* The Treasurer, having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Auditing Committee, at such time and place in July of each year as said Chairman may direct.

The Chairman of the Council, in the presence of another member of the Association, shall make a list of the numbers and amounts of the bonds belonging to the Association, and both shall make affidavit to such list, which shall then be forwarded to the Auditing Committee for their use in auditing the books of the officers of the Association.

*Ninth,* Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, saving-bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Auditing Committee.

*Tenth,* There shall be a meeting of the Auditing Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

*Eleventh,* The expense of the bond of the Treasurer, given by a Trust Company, shall be paid for from the Treasury.

*Twelfth,* The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

*Thirteenth*, The Finance Committee shall each year, previous to June 1st, present to the Council for its consideration a list of appropriations to cover the various expenditures of the coming fiscal year, the total of such appropriations to be based on the probable amount to be received from the annual dues for the coming year. No payment shall be made in excess of said appropriation except by special vote of the Council. *Provided*, however, that the Treasurer shall be authorized to transfer from one account to another, such amount as may be needed at any time, the amount of any such transfer not to exceed the sum of fifty (50) dollars.

*Fourteenth*, All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.



# ROLL OF MEMBERS.

---

## HONORARY MEMBERS.

### FOREIGN COUNTRIES.

#### ENGLAND.

Dr. John Attfield, F. R. S., *Watford*, 1871. Michael Carteighe, F. I. C., *London*, 1882.  
E. M. Holmes, F. L. S., *London*, 1899.

#### GERMANY.

Dr. Edward Schaer, *Strassburg*, 1877. Dr. Ernst Schmidt, Geb. Regierungsrath,  
*Marburg*, 1899.

#### INDIA.

David Hooper, F. I. C., F. C. S., *Calcutta*, 1899.

( 1101 )

## ACTIVE MEMBERS.

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.

(The names of Life Members in SMALL CAPITALS. Names of Life Members under the old Constitution in *italics*.)

### UNITED STATES OF AMERICA.

#### ALABAMA.

##### *Auburn.*

Dow, John Cameron .....1907  
Miller, Emerson Romeo .....1895  
Perdue, William Louis .....1907

##### *Calera.*

Marsh, George Henry .....1908

##### *Fort Morgan.*

Thurston, Edwin Joseph .....1904

##### *Gadsden.*

Cross, Elias Howell .....1905  
Wharton, Carl .....1905

##### *Huntsville.*

Walker, Elias Russell .....1908

##### *Mobile.*

CANDIDUS, PHILIP CHARLES .....1857  
Eichold, Bernard Herbert .....1905  
Maguire, Edward Sylvester .....1897  
Roe, John T. ....1907  
van Aller, Thomas S. ....1907  
Van Antwerp, James Callanan .....1905

##### *Montgomery.*

Knabe, Gustavus Alexander .....1876

##### *Prattville.*

Scott, Clarence Alexander .....1905

#### ARIZONA.

##### *Phoenix.*

Roziene, Robert Philip Mathias .....1904

##### *Prescott.*

Brisley, Harry .....1894

#### ARKANSAS.

##### *Arkansas City.*

Dedman, Richard .....1908

##### *Batesville.*

McMahan, Stonewall Jackson .....1908

##### *Camden.*

Morgan, Aylmer Lee .....1890

##### *Charleston.*

Yunker, Charles Harman .....1908

##### *Clarksville.*

Warren, Robert Arthur .....1907

##### *England.*

Ayres, Gold .....1907

##### *Fort Smith.*

Howard, Sam Allen .....1907  
Sparks, James Mitchell .....1894

##### *Hope.*

Gibson, John Sceva .....1908

##### *Hot Springs.*

Bancroft, Richard Bayard .....1907  
Battles, Wilton Lamar ... .....1908  
Beasley, Robert Sidney .....1906  
Browning, Ernest Ras .....1908  
Craft, Oliver Austin .....1907  
Deming, William Albert .....1907  
Eisele, Martin Augustine .....1907  
Ellis, William Henry .....1907  
Hamilton, Carl .....1908  
Hogaboom, George Adelbert .....1907  
Humphreys, Charles John .....1907  
Hunt, Byrd Henderson .....1907

Jackson, Samuel Rudolph ..... 1907  
 Jennings, Algernon Coleman ..... 1907  
 King, Jacob Harvey Curry ..... 1907  
 Klein, Ernest Frederick ..... 1894  
 Lehman, Charles Walter ..... 1907  
 Lemly, Charles Clifton ..... 1907  
 Meadows, Asbury Watkins ..... 1907  
 Morris, Richard Grant ..... 1907  
 Nutt, Sidney Matthews ..... 1908  
 Rowles, James Osborne ..... 1908  
 Schachleiter, Francis George ..... 1906  
 Schneck, George Earl ..... 1908  
 Scholastica, Sister Mary ..... 1907  
 Taylor, Carleton F. .... 1908  
 Weimar, Henry ..... 1907  
 Whittington, William George ..... 1908

*Imboden.*

Ketchum, James Spear ..... 1907

*Little Rock.*

Bond, John Barnitz ..... 1883  
 Bond, William Catis ..... 1907  
 Bordeaux, Henry ..... 1907  
 Dawson, Charles Hampton ..... 1907  
 Dowdy, Joseph Franklin ..... 1908  
 Fein, Mary Augustine ..... 1907  
 Ginocchio, James Alexander ..... 1906  
 Halliburton, Orlando ..... 1908  
 Hegarty, Charles Kiely ..... 1906  
 Knox, Steven Douglas .... 1907  
 McClerkin, Felix William ..... 1907  
 Snodgrass, Latta Kavanaugh ..... 1901  
 Stahel, Albert William ..... 1907  
 Wilkes, George Redford ..... 1907

*Newport.*

Bevens, Joe Lee ..... 1907

*Okolona.*

Young, James Joseph ..... 1908

*Paris.*

Hahn, Philip Anton ..... 1908

*Piggott.*

Potter, Herschel Edwards ..... 1907  
 Potter, Maynard H. .... 1906

*Pine Bluff.*

Brightwell, Newton Edward ..... 1908  
 DEWOODY, WILLIAM LAWRENCE ..... 1887

*Pocahontas.*

Hamil, William Earle ..... 1908

*Spadra.*

Stewart, John William ..... 1908

*Stuttgart.*

Webb, John William ..... 1908

*Warren.*

Appleton, William Riley ..... 1901

## CALIFORNIA.

*Angel Island.*

Mason, Myron Robinson ..... 1904

*Arcata, Humboldt Co.*

Bohmansson, Robert Hugo ..... 1901

Keller, William Otto Emanuel ..... 1908

*Auburn.*

Stevens, Frederick Solon ..... 1903

*Eureka.*

Keller, Charles Frederick, Jr. .... 1908

*Fruitvale.*

Philip, Waldemar Bruce ..... 1908

*Haywards.*

Sporndli, Ernest ..... 1906

*Livermore.*

McKown, Joseph Oscar ..... 1906

*Long Beach.*

Smith, Harley Earl ..... 1903

*Los Angeles.*

Banks, Walter C. .... 1907

Dean, Harry Glenn ..... 1907

Diggs, Lowell Clyde ..... 1907

English, William Morrison ..... 1907

Jones, Thomas William ..... 1907

Kirkland, Derwentwater ..... 1889

Leitch, James Craig ..... 1907

McKenna, Harry A. .... 1907

Newlon, Howard Marcus ..... 1907

Owen, Frank Dale ..... 1907

Peairs, Howard Allen ..... 1907

Schroeter, Herman M. .... 1907

Taylor, Walter Thomas ..... 1907

Trout, John Henry ..... 1907

Wilson, George Baright ..... 1907

Wolf, Frank Charles .... 1907

<i>Los Gatos.</i>		Searby, William Martin.....	1882
Lackenbach, Frederick Isadore.....	1907	Sharp, Solomon Albert.....	1902
<i>Mountain View.</i>		Stange, Carl Frederick .....	1897
Wagner, Louis .....	1908	STEELE, JAMES GURDEN .....	1859
<i>Napa.</i>		WENZELL, WILLIAM THEODORE.....	1870
Levinson, Joseph.....	1895	West, Fred .....	1906
Shoults, Robert Grafton .....	1901	Whilden, Charles Bennett .....	1907
<i>Oakland.</i>		Winter, James Henry .....	1904
Leet, Robert Andrew .....	1907	Wulzen, Dietrich Henry.....	1907
McCracken, Oscar Verian .....	1908	Zabaldano, Alexander.....	1902
Varney, Edward Francis.....	1892	<i>San José.</i>	
<i>Ontario.</i>		Munson, James Grant .....	1908
Jesson, Jacob .....	1872	<i>San Mateo.</i>	
<i>Pasadena.</i>		Baskette, Frank E.....	1907
Smith, Lauriston Stephen.....	1892	<i>San Rafael</i>	
<i>Sacramento.</i>		Kronberger, Israel Baruch .....	1908
Lichthardt, George Henry Philip .....	1902	<i>Vallejo.</i>	
<i>San Francisco.</i>		Fletcher, David Maass .....	1904
Arkin, James Andrew .....	1908	<i>Willows.</i>	
Ashim, Barach Jacob .....	1908	Harrington, Michael Timothy, Jr. ....	1908
Baer, Edward Arthur.....	1907	COLORADO.	
Bayly, Charles Alfred .....	1889	<i>Boulder.</i>	
Boulton, Emison Allen .....	1902	Bedard, George Henry .....	1908
Boyken, John William .....	1902	<i>Canon City.</i>	
Boyson, John Henry .....	1905	Seely, Anton H.....	1908
Briggs, Armand Eugene .....	1907	<i>Central City.</i>	
d'Artenay, Eugene.....	1907	Best, John.....	1886
Dawson, John Henry .....	1882	Davies, Llewellyn Powell .....	1891
Donahue, Henry M.....	1907	<i>Colorado City.</i>	
Donohue, Henry .....	1903	Meyer, Walter Ferdinand.....	1908
Drossel, August Adolph .....	1902	<i>Colorado Springs.</i>	
Drucker, August Elisha .....	1904	Brown, John Cecil.....	1905
Eschmann, Clemens Ludwig .....	1907	Depeyre, Louis Noel.....	1894
Esters von Krakau, James Henry Wil-		Ward, Augustus Jae.....	1893
liam .....	1897	<i>Cripple Creek.</i>	
Goodman, Laura .....	1907	Beitenman, William Wallace .....	1888
Grazer, Frederick Augustus .....	1904	<i>Denver.</i>	
Green, Franklin Theodore ..	1908	Anderson, John Curran .....	1908
Guehring, John, Jr.....	1907	Anglum, John .....	1902
Jorgenson, Edward B.....	1902	Bieser, Charles Leonard.....	1908
Miller, Charles .....	1897	Bresler, Simon L.....	1908
Neal, Charles W. ....	1907	Clark, Alfred William .....	1908
Poehner, Adolf Adam.....	1907	Clayton, Charles J.....	1905
Prior, Toney .....	1905		
Roehr, Clarissa May.....	1908		
Schmidt, Valentine .....	1887		
Schneider, Albert .....	1899		

Ford, Charles Mangan.....	1887
Hall, Frank Morgan.....	1908
Hover, William Adgate.....	1895
McCrea, Harry Francis.....	1908
McKenzie, Robert Henry.....	1908
Nitardy, Ferdinand William.....	1905
Shaw, Frederick Charles.....	1908
Soetje, Edward C.....	1908
Taylor, George Edward.....	1895
Thebus, William Frederick.....	1908
Walbrach, Arthur.....	1881

*Fort Collins.*

Scott, Alexander Weir.....	1906
----------------------------	------

*Glenwood Springs.*

Barnes, Charles Dean.....	1908
Parkison, Will Sanders.....	1908

*Grand Junction.*

Sturtivant, Samuel Bevier.....	1908
--------------------------------	------

*Holyoke.*

Smith, Frank Myron.....	1908
-------------------------	------

*Lafayette.*

Dow, John Peter.....	1904
----------------------	------

*Las Animas.*

Hammar, Alrik.....	1897
--------------------	------

*Leadville.*

Kolsch, Julius.....	1902
---------------------	------

*Longmont.*

Witting, Frederick Frank.....	1902
-------------------------------	------

*Louisville.*

Huber, Joseph A.....	1908
----------------------	------

*Ouray.*

Hellstern, Edward.....	1908
------------------------	------

*Pueblo.*

Strunz, Christopher Ernest.....	1908
---------------------------------	------

Campbell, Charles Berger.....	1902
Duckett, Walter G.....	1876
Easterday, Herbert Clifton.....	1893
Elliot, Charles Houston.....	1899
Flemer, Louis.....	1895
Floyd, Henry Bussey.....	1908
Franzoni, Joseph Dunbar.....	1900
Gahn, Henry.....	1902
Gordon, Frederick Troup..	1900
Gross, Charles Ernest.....	1900
Henkel, Alice.....	1902
Henry, Frank Clinton.....	1894
Herbst, William Parker ..	1895
Herty, Frank James.....	1907
Hilton, Samuel Louis.....	1890
Hoover, George William.....	1905
Howell, Percy Clinton.....	1906
Hunt, Reid.....	1904
Hurlebaus, George William.....	1895
Kalusowski, Henry E.....	1904
Kebler, Lyman Frederic.....	1894
Major, John Richards.....	1873
Motter, Murray Galt.....	1904
Neeley, Guy Minick.....	1900
Pearson, Paul.....	1908
Quigley, Richard Lucien.....	1902
Rabak, Frank.....	1905
Richardson, Willard Stowell.....	1900
Ryder, Louis Wadsworth.....	1907
Seidell, Atherton.....	1907
Sievers, Arthur.....	1906
SIMMS, GILES GREEN CRAYCROFT..	1860
Spire, William Burton.....	1908
Stevens, Edward.....	1903
Stott, Samuel Thompson.....	1900
Taylor, Augustus Carrier.....	1900
True, Rodney Howard.....	1904
Waldner, Paul Jacob.....	1900
Weber, Eugene.....	1906
Weller, Franklin Pierce.....	1900
Wilbert, Martin Inventius.....	1902
Wiley, Harvey Washington.....	1902

COLUMBIA, DISTRICT OF.

*Anacostia.*

Weiss, Conrad Henry.....	1900
--------------------------	------

*Washington.*

Alexander, Charles Ellis.....	1899
Blackmore, Henry Spencer.....	1896
BOYD, GEORGE WASHINGTON.....	1883
Bradbury, Wymond Henry.....	1895

CONNECTICUT.

*Bethel.*

Garvin, Patrick Joseph.....	1905
-----------------------------	------

*Bridgeport.*

Hartigan, Joseph Dennis.....	1902
Jamieson, George Alexander.....	1903
Leverty, John Augustine.....	1900

*Danielson.*

Morin, Ludger Joseph.....1905

*Hartford.*

Rapelye, Charles Andrew.....1876

Rapport, George I.....1907

Seinsoth, John Jacob.....1900

Stoughton, Dwight George.....1890

Williams, John Kirby.....1875

*Meriden.*

Mosher, William Wooster.....1894

*Middletown.*

PITT, JOHN RICHARD.....1872

*New Haven.*

Fleischner, Charles.....1905

Gessner, Emil Adolph.....1878

Hodgson, Joseph Arthur.....1903

Mix, Willis Lee.....1896

Spalding, Warren Alphonso.....1876

Wood, Alonzo Felton, Jr.....1890

Wood, James Prior.....1890

*New London.*

Daboll, Horace Hart.....1903

*Putnam.*

Dresser, George Edward.....1886

*Rockville.*

Woodall, Frederick.....1908

*Stanford.*

Finch, Charles Smith.....1900

*Waterbury.*

Ebbs, John Buddington.....1905

Newton, Clarke Henry William.....1905

Roemer, Frederick.....1905

Walker, Robert.....1908

Wilcox, Levi.....1903

Woodruff, Roderick Samuel.....1876

*Winsted.*

Judson, Arthur F.....1907

## DELAWARE.

*Wilmington.*

Finis, Ernest Alexander.....1908

Watson, Herbert Kennedy.....1888

## FLORIDA.

*De Land.*

Fisher, George Washington.....1893

*Fort De Soto.*

Goodman, Frank Stockett.....1907

*Inverness.*

Lloyd, Strauss Leonidas.....1906

*Jacksonville.*

Dixon, John Marion.....1894

Jones, William Daniel.....1903

Kirk, James Edgar.....1903

*Key West.*

Paine, E. Fernandez.....1906

Stier, Carl.....1902

*Miami.*

Abernethy, John Cocke.....1904

*Monticello.*

Palmer, John Dabney.....1902

*Ocala.*

Groves, Henry Conrad.....1903

*Palatka.*

Ramsaur, David Wilfong.....1902

*Pensacola.*

Pettersen, Ernst Wilhelm.....1905

Stearns, William Lincoln.....1903

*Satsuma Heights.*

Richtmann, William Oscar.....1904

*St. Augustine.*

Speer, Charles Claude.....1902

Woodman, Walter Irving.....1893

*Tampa.*

Berger, Ernest.....1902

Russell, Hamilton.....1905

## GEORGIA.

*Atlanta.*

Elkin, William Simpson.....1905

Kelley, Ruben Benjamin.....1905

Payne, George Frederick.....18)

*Augusta.*

Durban, Sebastian Charles.....1883

LAND, ROBERT HENRY.....1859

Land, Robert Henry, Jr.....1902



Feldkamp, Charles Louis .....	1908	Lehman, Louis.....	1905
Finninger, Paul Ernest.....	1906	Letzler, Alex. Emil .....	1906
Fischnar, John Ferdinand.....	1905	Light, Isam M.....	1907
Forsyth, William Kitchin .....	1902	Lorenz, John Stanley.....	1906
Friesenecker, Charles M.....	1907	Mares, Frank Martin.....	1902
Fry, Herman.....	1902	Martin, John Fraley .....	1905
Fry, Narcys George .....	1906	Mason, Ernest Lynn .....	1908
FULLER, OLIVER FRANKLIN.....	1869	Mathison, Soren .....	1905
<i>Gale Edwin Oscar</i> .....	1857	Matthews, Charles Edwards.....	1893
Gathercoal, Edmund Norris.....	1905	McClugage, John Jordan.....	1905
Glogan, Alexander.....	1908	McClure, Ulysses Gilmore.....	1906
Gordin, Henry Mann.....	1899	McConnell, Charles Henry.....	1899
Grassly, Charles William.....	1884	McQuillen, Francis .....	1906
Gray, Margaret McClintock (Mrs.)...	1901	McVay, Ernest Avery .....	1906
Gray, William.....	1892	Meixner, Fred Morris Frankford....	1906
Green, Carl Victor.....	1906	Meyer, Frederick Hugo .....	1907
Haeger, Fred.....	1906	Miller, Albert .....	1907
Haeseler, Frank Preston .....	1906	Miner, Maurice Ashbel .....	1880
Haeseler, Loren Milton .....	1906	Mrazek, Leo Ludwig .....	1906
Hallberg, Carl Svante Nicanor. ....	1879	Mygdal, Thorkil .....	1908
Harrison, William Henry.....	1905	Niethammer, Otto F.....	1905
Hartwig, Otto Julius .....	1892	Oglesby, George Daniel .....	1905
Hauber, Peter Paul .....	1906	Oldberg, Oscar.....	1873
Heinemann, Lucy .....	1908	Ortenstein, Harry M.....	1906
Heiss, Ernest J.....	1907	Patterson, Charles Waggener.....	1905
Hellmuth, Joseph Anthony.....	1905	<i>Patterson, Theodore Henry</i> .....	1869
Hereth, Franklin Samuel .....	1893	Pfaff, Henry, Jr.....	1907
Hermanek, Joseph Charles.....	1904	Phillips, William Robetoy .....	1908
Hilpert, Willis Store .....	1908	Pierce, Olive Blake .....	1906
Hiss, Andrew Emil .....	1906	Porter, George Melville.....	1906
Hodson, Daniel F .....	1907	Potts, Thomas Humphreys.....	1906
Hull, Ralph Wilbur .....	1906	Puckner, William August .....	1888
Irvine, Ephraim Dinsmore .....	1908	Rhode, Rudolph Ernst .....	1887
JAMESON, THOMAS NEVIN.....	1903	Riemenschneider, Julius Henry .....	1906
Jehlik, Anton Josef .....	1906	Rommel, Hans Carl.....	1907
Jenseh, Gerhard H.....	1906	Rosenthal, Joseph .....	1906
Johnson, Thur William. ....	1908	Rounds, Marvin Bird Cleo .....	1905
Johnstone, J. C.....	1907	Rozanski, Boleslaus J.....	1906
Josenhans, Reinhardt Carl Johannes.	1907	Runkel, Julia.....	1905
Jungk, Walter August.....	1907	Salchert, Herman Anton.....	1906
Kahn, Julius H.....	1905	Sandkoetter, Henry P.....	1908
Karg, George .....	1907	Sass, Stephen Konrad.....	1905
Kasper, Albert Franklin .....	1906	Sawyer, Hilon Hill .....	1906
Klenze, William Theodore .....	1905	Schaper, Henry Frederick .....	1905
Knoche, William Philip.....	1908	Scheips, Theodor Immanuel .....	1905
Koch, Fred. Conrad.....	1907	Scherer, Andrew .....	1884
Kroavica, Antony.....	1907	Schmidt, Florian Charles.....	1882
Krizan, William.....	1906	Schmidt, Florian Joseph .....	1906
Ladish, Erich Herman.....	1905	Schmidt, Frederick Michael.....	1887
Lambert, Richard Jay .....	1906	Schmitt, John Jacob .....	1908
Langenhan, Henry August.....	1908	Schweitzer, Joseph.....	1906
Larsen, Lars Peter .....	1908	Shurtleff, Wilford C.....	1905



Smith, Ralph Harvey .....	1906	<i>Hawthorne.</i>	
Snow, Clyde Mason .....	1903	Wicarius, Max John .....	1908
Snow, Herbert Waldemar .....	1906	<i>Joliet.</i>	
Soult, Roy Mont .....	1905	Fahrner, Alphonse Anthony .....	1906
Storer, Charles Adelbert .....	1906	Ruesch, William Emanuel .....	1907
Stuchlik, John .....	1906	<i>Kankakee.</i>	
Truax, Charles .....	1882	Schubert, John Joseph .....	1907
Umenhofer, Adolph .....	1908	<i>Liberty.</i>	
Valentine, William George .....	1905	Mercer, William Elmer .....	1902
Van Schaack, Cornelius Peter .....	1905	<i>Mendota.</i>	
Vause, H. Russell .....	1906	Tesche, Adolph Gustav .....	1908
VOISS, ARCADIUS .....	1901	<i>Moline.</i>	
Wells, James Herbert .....	1908	Lindvall, Charles Gustaf .....	1897
Weydell, K. Albus .....	1906	Sohrbeck, George Henry .....	1888
WHITFIELD, THOMAS .....	1865	Sohrbeck, George William .....	1897
Williamson, Wyley Porter .....	1907	<i>Mount Vernon.</i>	
Wilson, Richard Bruce .....	1908	Bond, Jackson Newton .....	1902
Winberg, Washington William .....	1906	Morse, Edward Worth .....	1896
WOLTERSDORF, LOUIS .....	1865	<i>Oak Park.</i>	
Wooten, Thomas Victor .....	1893	Foster, Frank Homer .....	1908
Yeomans, Sidney Clarence .....	1906	McCauley, Charles Edward .....	1903
Zamentowsky, David .....	1906	Walter, Charles Albert .....	1899
Zelinski, Walter Franz von .....	1905	<i>Orion.</i>	
Zuber, A. E. ....	1906	Schneider, Carl Henry .....	1906
Zurawski, Narcys J. ....	1906	<i>Pekin.</i>	
<i>East St. Louis.</i>		Ehrlicher, Henry Michael .....	1892
Knoebel, Percy Thomas .....	1907	<i>Peoria.</i>	
Knoebel, Thomas .....	1892	Benton, Wilber Merritt .....	1888
Steyh, George Philip .....	1907	Lueder, Fritz .....	1894
<i>Evanston.</i>		<i>Pesotum.</i>	
Benedict, Philip Vincent .....	1908	Hoffman, George Frederick .....	1902
Mills, George P. ....	1907	<i>Polo.</i>	
<i>Fairmount.</i>		Clothier, Charles Roland .....	1905
Tilton, Claude Enoch .....	1905	<i>Princeton.</i>	
<i>Fort Sheridan.</i>		Case, George Edwin .....	1906
Luve, Frank A. A. ....	1902	<i>Quincy.</i>	
Riess, Herman William .....	1903	Eisele, George .....	1908
<i>Freeport.</i>		Heidbreder, Albert Henry .....	1905
McNess, Frederick William .....	1906	<i>Sadorus.</i>	
<i>Geneseo.</i>		Craw, Eugene Eunison .....	1908
Stamm, Dante Milton .....	1896		
<i>Girard, Macoupin Co.</i>			
Deck, Lewis Cass .....	1901		
<i>Grayville.</i>			
Wheatcroft, John Christopher .....	1906		
<i>Greenup.</i>			
Conzet, Rufus Warren .....	1904		

<i>Springfield.</i>		Frauer, Herman Emanuel .....	1881
Dodds, Richard Newton.....		Gertler, John Henry .....	1905
<i>Stronghurst, Henderson Co.</i>		Huder, Henry J.....	1894
Harter, Isaac Foster .....		Hurty, John Newell.....	1882
<i>Tiskitwa.</i>		Kassulke, August.....	1905
Stimson, Charlotte Elizabeth.....		Keemer, Edgar Brooks.....	1907
<i>Tuscola.</i>		Leftwich, Harry Percy.....	1906
Stacy, Marion Franklin.....		Lilly, Eli .....	1906
INDIANA.		Lilly, Josiah Kirby.....	1890
<i>Angola.</i>		Lynn, Charles Jackson .....	1906
Ritter, Clyde.....		Mueller, J. George.....	1906
Sherrard, Charles Cornell.....		Schopp, Otto.....	1906
<i>Batesville.</i>		Schwartz, Maurice Paul .....	1906
Baas, George Adam.....		Stewart, Ernest Eugene .....	1906
<i>Bluffton.</i>		Stucky, Edward W .....	1908
Stout, Marion Alphon.....		Thorburn, Albert David .....	1902
<i>Columbus.</i>		Thornburgh, Thomas Routh.....	1908
Otto, Theodor Gotthelf Eduard.....		Waddell, Minor T .....	1899
Stahlhutb, Ernest Henry William.....		Walker, William Arthur.....	1905
<i>East Chicago.</i>		Wakins, Charles Williams .....	1907
Veaco, Sidney Harold .....		Werner, William F.....	1908
<i>Evansville.</i>		Zimmer, Harry Edgar.....	1908
Bohn, George W.....		<i>Lafayette.</i>	
Pelz, Charles Theodore.....		Green, Arthur Lawrence.....	1906
Petersheim, John Frederick .....		Schultz, John Jacob.....	1904
Tepe, Louis .....		Sturmer, Julius William .....	1901
Troxler, Robert Fulton .....		<i>La Porte.</i>	
<i>Fort Wayne.</i>		Meissner, Frederick William, Jr.....	1890
Emanuel, Julia Esther.....		<i>Logansport.</i>	
Gross, William Otto .....		Hoffman, George L.....	1906
Mertz, Edward Leander .....		Hoffman, George William .....	1904
Woodworth, Benjamin Studley.....		Porter, William Hamlin .....	1906
Woodworth, Charles Beecher.....		<i>Mishawaka.</i>	
<i>Indianapolis.</i>		Graham, Abner B.....	1907
Blodau, Robert P....		<i>Mt. Vernon.</i>	
Carter, Frank Henry.....		Fogas, William Henry.....	1907
Carter, Harlen Wilson.....		<i>New Albany.</i>	
Coons, William I.....		Knoefel, Bruno.....	1896
Eberhardt, Ernest Godlove.....		Knoefel, Charles Deitrick .....	1894
Eichrodt, Mary Elizabeth.....		McDonald, Harry Stewart .....	1905
Eldred, Frank Randall.....		<i>New Carlisle.</i>	
Ferber, Edward .....		Warner, Francis Delop .....	1904
Francis, J. Richard .....		<i>Notre Dame.</i>	
		Green, Robert Lee.....	1900
		<i>Rusksville.</i>	
		Wilson, Charles Frazee.....	1900

*Salem.*

Rudder, William Hiram.....1907

*South Bend.*

Bastian, Otto Carl.....1903

Coonley, Charles .....1902

Eliel, Leo .....1883

Meyer, Martin Monroe .....1897

Reyer, Emil .....1907

Weiser, William Augustus .....1904

*Tell City.*

Schreiber, Charles Christian Frederic

August.....1901

*Terre Haute.*

Buntin, William Campbell .....1906

*Troy.*

Gaesser, Theobald Theodore .....1901

*Valparaiso.*

Heineman, Albert F .....1905

Roe, Joseph Newton.....1902

Timmons, George Demming .....1905

*Warren.*

Hickerson, William Henry.....1894

*Winchester.*

Sala, Albert Franklin.....1905

*IOWA.**Amara.*

Koch, August Frank .....1903

Schadt, Conrad.....1903

*Auburn.*

Spatar, William Charles .....1905

*Bacon.*

Ridgway, Lemuel Augustus .....1882

*Calender.*

Larson, Martin.....1906

*Cedar Rapids.*

Boyson, George H .....1908

*Charles City.*

Legel, John Gotthelf .....1897

*Clear Lake.*

Etzel, John Leonhardt.....1897

*Davenport.*

BAL LARD, JOHN WINTHROP .....1871

*Des Moines.*

Berner, Carl Albert .....1903

Howard, Fletcher (Mrs.) .....1905

Macy, Sherman Riley .....1891

*Dubuque.*

Torbert, Willard Horatio .....1887

Wittmer, Joseph Washington.....1896

*Fort Dodge.*

OLESON, OLAF MARTIN.....1877

*Fort Madison.*

SCHAFFER, GEORGE HENRY .....1871

*Homestead.*

Miller, Frederick William.....1902

*Iowa City.*

Boerner, Emil Louis.....1877

Teeters, Wilber John .....1902

*Kalona.*

Rogers, Ora Leroy .....1907

*Keokuk.*

Kiedaisch, George Arthur .....1904

*Lawler.*

Landon, Ray Irving.....1908

*Marshalltown.*

Mayer, Peter.....1906

*Muscatine.*

Halstead, Alice Louisa (Mrs.),.....1892

*New Hampton.*

Sayers, Milton Cary.....1906

*Pocahontas.*

Grover, Robert Oswald.....1908

*Sioux City.*

Andreen, Carl.....1902

Koelle, Otto Charles .....1902

Moore, Silas Harwood .....1880

SCHERLING, GUSTAV .....1884

Thelander, Creston Carlos.....1902

Thompson, Edwin Thomas.....1902

*Stuart.*

Treat, Joseph Augustus.....1885

*Winfield, Henry Co.*

Lindly, John Milton.....1901

## KANSAS.

*Atchison.*

Myers, Carvosso Oursler ..... 1904  
 Noll, Mathias ..... 1901

*Ellsworth.*

Sheriff, William Ebenezer ..... 1904

*Gypsum City, Saline Co.*

Schmitter, Jonathan ..... 1892

*Lansing.*

Shudrowitz, Frank Stanislas ..... 1904

*Lawrence.*

Havenhill, L. D. .... 1900

LEIS, GEORGE ..... 1869

Moore, John Thomas ..... 1888

Sayre, Lucius Elmer ..... 1883

*Leavenworth.*

Mehl, Henry William ..... 1905

*North Topeka.*

Duncan, George Howard ..... 1908

*Onaga.*

Kester, Joseph A. .... 1904

*Ottawa.*

Becker, Charles Lewis ..... 1892

*Overbrook.*

Topping, Arthur Ellsworth ..... 1904

*Topeka.*

Holliday, Francis Emlen ..... 1900

*Winfield.*

Friedenburg, Maximilian Wilmer .... 1904

## KENTUCKY.

*Ashtand.*

Lordier, Charles Joseph ..... 1907

*Bowling Green.*

Wilson, George Thomas ..... 1907

*Covington.*

Pieck, Edward Ludwig ..... 1887

Willenbrink, Charles Anthony ..... 1904

*Frankfort.*

Gayle, John William ..... 1891

*Hawesville.*

Patterson, George Orville ..... 1907

*Henderson.*

Baldauf, Julius Leopold ..... 1907

Elam, John Thomas ..... 1907

*Hopkinsville.*

Cook, James Otey ..... 1907

Elgin, Lewis Lee ..... 1907

*Lexington.*

Cooper, James Evans ..... 1907

Harting, Rudolph R. .... 1902

*Louisville.*

Bell, Emil Remigius ..... 1890

Bohlsen, Henry Christopher ..... 1908

Curry, Gordon Laten ..... 1900

DIEHL, CONRAD LEWIS ..... 1863

Dilly, Oscar Charles ..... 1888

Dimmitt, Addison ..... 1895

Hurley, Horace Oliver ..... 1907

JONES, SIMON NEWTON ..... 1870

Krul, John George ..... 1907

Mueller, Otto Edward ..... 1907

NEWMAN, GEORGE ABNER ..... 1866

Overstreet, William Payne ..... 1893

Overton, Burr Martin ..... 1903

Peter, Minor Cary ..... 1894

Schlosser, Peter ..... 1902

Schoettlin, Albert John ..... 1882

Treber, Frederick William ..... 1907

Troxler, Constantine, Jr. .... 1896

Votteler, William ..... 1895

Wassmann, Louis William ..... 1907

*Mt. Sterling.*

White, Robin Hope ..... 1907

*Newport.*

Bange, Otto Franz ..... 1904

Greule, Albert Martin ..... 1903

*Paducah.*

Koegel, Herman Henry ..... 1907

*Paris.*

Clarke, Charles Jordan ..... 1904

*Winchester.*

Martin, James Henderson ..... 1908

## LOUISIANA.

*Donaldsonville.*

Sarradet, Atal August ..... 1905

*Fennings.*

Richard, Valleix Bernard ..... 1905

*New Iberia.*

Quirk, Edmond Charles, Jr. .... 1904

*New Orleans.*

Adams, James Ogilvie ..... 1904

Asher, Philip ..... 1905

Breslin, Michael Thomas ..... 1905

Brown, George Stewart ..... 1900

Capdau, Pierre August ..... 1902

Castillon, Louis Albert ..... 1904

Earhart, Frederick A. .... 1904

Finlay, Alexander Kirkwood ..... 1883

Gibson, Robert Henry ..... 1906

Godbold, Fabius Chapman ..... 1887

Guidry, Ambrose Joseph ..... 1903

Holt, Edwin Merrimon ..... 1902

Katz, Gustave ..... 1903

Legendre, Joseph Amilcar ..... 1891

Levy, William Michael ..... 1894

Lyons, Lucien Eugene ..... 1904

Magruder, Charles Galloway ..... 1904

Marion, Etienne James ..... 1903

Metz, Abraham Lewis ..... 1887

Napp, William George ..... 1906

Posey, Henry Gibbon ..... 1905

Quin, Frank Woodard ..... 1902

Samson, Max ..... 1900

Sauvinet, Charles Daniel ..... 1902

Villere, Rene Louis ..... 1905

Walsdorf, Charles Albert ..... 1904

Walsdorf, Edward H. .... 1904

Weillbaecher, Frank Eugene ..... 1904

Wirth, Adam ..... 1904

Wunderlich, Edward ..... 1891

*Shreveport.*

Spencer, James Woodburn .... 1908

## MAINE.

*Auburn.*

Burnham, Ralph Foster ..... 1904

Jones, Oscar Winthrop ..... 1902

*Augusta.*

Coughlin, John ..... 1908

Partridge, Frank Reuben ..... 1895

*Bangor.*

Davis, Charles Howard ..... 1903

HARLOW, NOAH SPARHAWK ..... 1859

Sweet, Caldwell ..... 1881

*Biddeford.*

Boynton, Herschel ..... 1875

Traynor, Charles Francis ..... 1902

*Brunswick.*

Leavitt, Adoniram Judson ..... 1905

Wilson, Frederick Henry ..... 1906

*Danforth.*

Porter, Martin Luther ..... 1904

*Houlton.*

White, Simeon Lugin ..... 1908

*Kennebunk.*

Meserve, Albert Wesley ..... 1905

*Lewiston.*

Lowell, Edward Mark ..... 1896

*Orono.*

Jackman, Wilbur Fisk ..... 1899

Seymour, James ..... 1903

*Portland.*

Bierman, Clarence H. .... 1908

Cook, Alfred Page ..... 1902

Drew, Walter Israel ..... 1896

Frye, George Carlton ..... 1879

Hay, Edward Allston ..... 1889

Morse, Frank Dana ..... 1902

Perkins, Benjamin Abbott ..... 1878

Rand, Daniel Moulton ..... 1892

Schlotterbeck, Augustus George ..... 1896

Tuttle, George O. .... 1907

*Saco.*

Sawyer, Charles Henry ..... 1896

*Skowhegan.*

Bucknam, Frank William ..... 1907

*York Village.*

Sanford, John Foy ..... 1902

## MARYLAND.

*Annapolis.*

Henkel, Charles Bernard ..... 1902

*Baltimore.*

Baily, George Frank ..... 1906

Barnett, Joel Jones ..... 1899

Base, Daniel.....	1858	Smith, Frederick Alfred Upsher.....	1907
Bond, John Emory.....	1907	Smith, Owen Crause.....	1906
Brack, Charles Enil.....	1876	Smith, Theodorice.....	1890
Brickman, Arthur Otto.....	1898	Stearns, Cletus Otto.....	1906
Bunting, George A.....	1907	Stichel, William Kleinheim.....	1907
Burrough, Horace, Jr.....	1901	Thomas, John Benjamin.....	1906
Butsch, John Louis.....	1906	Thomas, Oscar Bernard.....	1907
Caspari, Charles, Jr.....	1883	Walz, Jacob Lee.....	1906
Culbreth, David Marvel Reynolds.....	1883	Ware, Charles Howard.....	1898
Daneke, Howard Nelson.....	1907	Werckshagen, Otto.....	1907
Davis, John Alexander.....	1894	Westcott, James Walling.....	1890
Dickson, Frederick W.....	1906	Whittle, William A.....	1908
Dohme, Alfred Robert Louis.....	1891	Williamson, Robert Edward Lee.....	1898
DOHME, CHARLES EMILE.....	1863	WINKELMANN, JOHN HENRY.....	1864
DOHME, LOUIS.....	1859	Wolf, Charles Augustine.....	1906
Downes, Edwin Richards.....	1907	Wolf, James Carlton.....	1905
Dunning, Henry Armitt Brown.....	1902	Wolf, Michael Francis.....	1906
ELLIOTT, HENRY ALEXANDER.....	1859		
Engelhardt, Hermann.....	1907	<i>Brookeville.</i>	
Feick, Charles.....	1901	Howard, Henry.....	1905
Fouch, Willham M.....	1906	<i>Catonsville.</i>	
Frames, John Fuller.....	1890	Simon, William.....	1885
Gilpin, Henry Brooke.....	1889	<i>Chestertown.</i>	
Graham, Karl Harris.....	1907	Toulson, Milbourne Asbury.....	1905
Hancock, James Etchberger.....	1907	<i>Emmitsburg.</i>	
HANCOCK, JOHN FRANCIS.....	1863	Frailey, Carson Peter.....	1908
Hengst, John Edwin.....	1900	<i>Frederick.</i>	
Hess, Nicholas Alphonso.....	1908	Pearré, Albert Lindsay.....	1906
Hewisler, Philip Ignatius.....	1903	<i>Hagerstown.</i>	
Hill, Aubrey Thomas.....	1907	Meredith, Harry Lionel.....	1900
Hodson, Eugene Withers.....	1907	<i>Hancock.</i>	
Hynson, Henry Parr.....	1890	Hook, James Patrick.....	1905
Kelly, Evander Frank.....	1905	<i>Roland Park.</i>	
Kelly, Thomas.....	1907	Bacon, Ephraim.....	1905
Kornmann, Henry.....	1899	<i>Snow Hill.</i>	
Lillich, Bert Allen.....	1907	Powell, William Cottingham.....	1895
Lowry, William John, Jr.....	1906	<i>Taneytown.</i>	
Maisch, Henry.....	1898	McKinney, Robert Sentman.....	1898
Mansfield, Samuel.....	1898		
McCartney, Frank Leslie.....	1907	MASSACHUSETTS.	
Meyer, Adolph Carl.....	1905	<i>Amherst.</i>	
Meyer, Charles Lewis.....	1901	Deuel, C. Fred.....	1907
Millard, David Rockwell.....	1899	<i>Beverly.</i>	
Morgan, Charles.....	1899	Currier, Ralph Albee.....	1908
Muth, George Giustiniani.....	1906		
Muth, John Clement.....	1898		
Muth, John Sebastian.....	1898		
Neal, Charles Chaplin.....	1906		
Schimmel, Maurice Solon.....	1906		
Schulze, Louis.....	1892		
Schumann, Otto George.....	1902		
Sharp, Alpheus Phineas.....	1855		

*Boston.*

Baird, Julian William .....	1894
Baker, Walter Nelson .....	1906
BASSETT, CHARLES HARRISON .....	1867
Burnham, Alfred Augustus, Jr. ....	1891
Carter, Frederick Louis .....	1905
Cotton, James Byers .....	1865
Connelly, Frederick William. ....	1907
Cramer, Max .....	1881
Doliber, Thomas .....	1859
DRURY, LINUS DANA .....	1871
Finneran, James Francis .....	1906
Gammon, Irving Parker .... .	1906
Gerald, Herbert Franklin .....	1906
Godding, John Granville .....	1875
Griffin, Lyman Whiting .....	1907
Horton, Charles Henry .....	1905
Jones, James Taber .....	1875
McCombie, James Newman .....	1906
Pierce, William Herbert .....	1879
Pitts, William Burton .....	1903
Sawyer, John R. ....	1908
Sawyer, William Frederick .....	1885
Sharples, Stephen Paschell .....	1875
SHEPARD, SAMUEL ARUS DARLINGTON.	1865
Thompson, Leon Albert .....	1907
Vargas-Heredia, Jorge .....	1891
West, Charles Alfred .....	1892
WILSON, BENJAMIN OSGOOD .....	1859

*Brockton.*

Randall, Frank Otis .....	1893
---------------------------	------

*Brookline.*

Clapp, Lowell Tuckerman .....	1905
-------------------------------	------

*Cambridge.*

Claffin, Walter Addison .....	1896
Phillips, Carrie Elizabeth .....	1894
Seaverns, Martha Gilbert .....	1902

*Cambridgeport.*

La Pierre, Elii Henry .....	1892
Milligan, John Dean .....	1900
Norton, George Edward .....	1895

*Clinton.*

Burke, Walter Jordan .....	1907
----------------------------	------

*Concord.*

Richardson, Horatio Stillman .....	1892
------------------------------------	------

*Dorchester Centre.*

Davis, Charles Henry .....	1907
----------------------------	------

Tripp, Arthur Horton .....	1906
----------------------------	------

*Fast Boston.*

Packard, Charles Herbert .....	1906
--------------------------------	------

*Everett.*

Wagner, Arthur Carl .....	1907
---------------------------	------

*Fairhaven.*

Snow, Levi Morton .....	1905
-------------------------	------

*Fall River.*

Riddell, Benjamin Franklin .....	1892
----------------------------------	------

*Fitchburg.*

Coté, André Alexandre .....	1904
-----------------------------	------

Day, Edward John .....	1901
------------------------	------

Estabrook, Henry Arthur .....	1886
-------------------------------	------

*Holyoke.*

Heinritz, Lebrecht Gustav. ....	1902
---------------------------------	------

*Hudson.*

Wheeler, Carlton Bancroft .....	1907
---------------------------------	------

*Jamaica Plain.*

Lewis, Ernest Grant .....	1892
---------------------------	------

Smith, Linville Holton .....	1892
------------------------------	------

*Lawrence.*

Bower, Edward A. ....	1907
-----------------------	------

Glover, William Henry .....	1891
-----------------------------	------

Smith, Albert Burnham .....	1907
-----------------------------	------

*Leominster.*

Nixon, Charles Frederic .....	1900
-------------------------------	------

*Lowell.*

BAILEY, FREDERICK .....	1869
-------------------------	------

HOOD, CHARLES IRA .....	1871
-------------------------	------

Willson, George Arnold .....	1906
------------------------------	------

*Ludlow.*

Booth, Albert Edward .....	1907
----------------------------	------

*Malden.*

Keaney, James John .....	1899
--------------------------	------

*Marlboro.*

Barnard, Harry Ames .....	1907
---------------------------	------

Gorman, Mary Cecilia .....	1907
----------------------------	------

*Mattapan.*

Best, Samuel M. ....	1906
----------------------	------

*New Bedford.*

BLAKE, JAMES EDWIN .....	1866
--------------------------	------

SHURTLEFF, ISRAEL HAMMOND .....	1875
---------------------------------	------

<i>Newburyport.</i>		Guerin, James Francis.....	1898
Castelhun, Karl .....	1902	Scott, George Theodore .....	1883
Davis, Charles Leland.....	1897		
Goodwin, William Wells.....	1853		
<i>Newton.</i>		MICHIGAN.	
Crowdle, John Edward .....	1894	<i>Ann Arbor.</i>	
Hubbard, Frederick Arthur .....	1907	Calkins, Eleazer E. ....	1903
Hudson, Arthur.....	1882	EBERBACH, OTTMAR .....	1869
<i>Newton Centre.</i>		Eckler, Charles Ralph.....	1903
Hassett, Thomas Bernard.....	1907	Schlotterbeck, Julius Otto.....	1888
<i>Pittsfield.</i>		Stevens, Alviso Burdette.....	1885
Engstrom, Ernst Oscar .....	1906	Tracy, Kenneth William .....	1907
<i>Provincetown.</i>		<i>Berrien Springs.</i>	
Adams, James Holmes.....	1906	Kephart, Philip.....	1902
<i>Raynham.</i>		<i>Cadillac.</i>	
Crossman, George Alvin.....	1872	Webber, Arthur Harrison.....	1903
<i>Revere.</i>		<i>Detroit.</i>	
Larrahee, Charles William .....	1906	Averyl, Henry Madison .....	1907
<i>Roxbury.</i>		Blome, Walter Henry.....	1903
Ryder, Horace Foster.....	1907	Francis, John Miller .....	1906
<i>Salem.</i>		Hall, William Alanson .....	1888
Nichols, Thomas Boyden.....	1876	Helfman, Joseph .....	1894
Price, Charles Henry.....	1882	Houghton, Elijah Mark .....	1889
Price, Joseph .....	1888	Iltis, George Washington .....	1905
<i>Sharon.</i>		Knox, James Wesley Thompson.....	1898
Wheeler, William Dexter.....	1892	Loertz, Carl Edward.....	1907
<i>Shelburne Falls.</i>		LYONS, ALBERT BYRON.....	1885
Baker, Edwin.....	1875	Mallard, Albert E.....	1907
<i>Southborough.</i>		Mann, Charles Frederick.....	1903
Newton, Robert Albro .....	1906	Mason, Harry Beckwith .....	1896
<i>Springfield.</i>		McClure, Clarence Minor.....	1907
Erck, Philip Frederick.....	1906	Nelson, Edwin Horatio.....	1904
<i>Stoneham.</i>		Ohliger, Willard.....	1903
PATCH, EDGAR LEONARD .....	1872	Perry, Frederick William Riley .....	1885
<i>Waltham.</i>		Ryan, Frank Gibbs .....	1892
Gleason, Patrick Sebastian.....	1904	Schulz, Henry Louis .....	1905
<i>Wellesley.</i>		Scoville, Wilbur Lincoln .....	1891
Fitzpatrick, Patrick Joseph.....	1908	Seltzer, Leonard Adams .....	1899
<i>Worcester.</i>		Vernor, James .....	1866
Brewer, Howard Dickinson .....	1902	Wheeler, Albert Alton .....	1906
Cutler, Bertram Crocker .....	1905	<i>Flushing.</i>	
		Sprague, Wesson Gage.....	1895
		<i>Grand Rapids.</i>	
		Kirchgessner, William Carl.....	1903
		Muir, John Davidson.....	1903
		Schmidt, Walter Karl .....	1903
		<i>Holly.</i>	
		Gidley, William Francis .....	1907



<i>Ionia.</i>	<i>New Ulm.</i>
Gundrum, George ..... 1882	Eckstein, Andrew Joseph ..... 1895
<i>Kalamazoo.</i>	<i>Ortonville.</i>
Todd, Albert May ..... 1885	Nielson, John ..... 1897
<i>Lansing.</i>	<i>Pelican Rapids, Otter Tail Co.</i>
Holm, Marinus Larsen ..... 1905	Axness, Ole Mikkelsen ..... 1895
<i>Monroe.</i>	<i>St. Paul.</i>
Hagans, Daniel Allen ..... 1903	Campbell, Albert Alexander ..... 1902
<i>Petoskey.</i>	Collier, William Kelly ..... 1897
Atkins, Charles Wesley ..... 1908	Conger, Frederic Albert ..... 1907
<i>Saginaw.</i>	Conger, Stephen Benson ..... 1907
Heim, Henry ..... 1900	Frost, William Arthur ..... 1892
Prall, Delbert Elwyn ..... 1902	Heller, Charles Tomkins ..... 1906
MINNESOTA.	Jelinek, John Peter ..... 1907
<i>Avoca.</i>	Parker, Frederick M ..... 1902
Bachman, Gustav ..... 1905	Westby, Severs ..... 1907
<i>Duluth.</i>	<i>Two Harbors.</i>
Abbett, William Allen ..... 1901	Efstrand, Wilhelm ..... 1905
LeRicheux, Alfred Charles ..... 1901	<i>Winona.</i>
Sweeney, Robert Ormsby ..... 1866	Leeb, Theodore Feargod ..... 1903
<i>East Grand Forks.</i>	Rohr, Arthur von ..... 1908
Kingman, Ignatius ..... 1904	MISSISSIPPI.
<i>Fergus Falls.</i>	<i>Aberdeen, Monroe Co.</i>
Biese, John Henry ..... 1908	Eckford, Joseph William ..... 1883
<i>Jackson.</i>	<i>Columbus.</i>
Colby, Charles Ludwig ..... 1904	Caine, S. Lee ..... 1904
<i>Kennedy.</i>	<i>Ellisville.</i>
Arneson, Thomas ..... 1906	Ward, Enoch James ..... 1905
<i>Mankato.</i>	<i>Kosciusko.</i>
Lamm, Edward Leo ..... 1906	Hammond, William Jesse, Jr. .... 1908
Weed, Nelson ..... 1905	<i>Meridian.</i>
<i>Minneapolis.</i>	Bethea, Oscar Walter ..... 1902
Allen, E. Floyd ..... 1885	Renfro, Harris Burt ..... 1904
Butters, Charles Hayes ..... 1907	<i>Osyka.</i>
Danek, John Francis ..... 1895	Coody, Archibald Stinson ..... 1906
Gamble, Stewart ..... 1897	<i>Port Gibson.</i>
Huhn, Charles Hugo ..... 1905	Shreve, John Alexander ..... 1880
King, George Alexander Newton. .... 1892	<i>Summit.</i>
Puhl, Richard Herman ..... 1908	Covington, Samuel Maurice ..... 1906
Sweet, William Herbert ..... 1905	MISSOURI.
Thompson, Albert Delano ..... 1895	<i>Boonville.</i>
Voegeli, Thomas ..... 1905	Mittelbach, William ..... 1891
Wanous, Josephine Anna ..... 1897	
Wittich, Matthew Henry ..... 1897	
Wulling, Frederick John ..... 1893	

<i>Carrollton.</i>		Hahn, Charles William John Henry .. 1901	
PETIT, HENRY McEWEN .....	1860	Hemm, Francis .....	1881
<i>Centralia.</i>		Ilhardt, William Kellerman .....	1901
Hope, Robert Lee .....	1901	Ittner, William Frederick .....	1903
<i>Jefferson City.</i>		Judge, Charles Rogers .....	1901
Brandenberger, Adolph .....	1894	Klie, George Henry Charles .....	1878
<i>Kansas City.</i>		Kurtz, Irwin William .....	1904
Baker, De Forest .....	1908	Lamar, William Robinson .....	1901
Crampton, Ferd Leslie .....	1896	MALLINCKRODT, EDWARD .....	1869
Federmann, William Martin .....	1901	May, Charles Charlotte .....	1898
Hess, Paul Ludwig .....	1892	Merrell, George Robert .....	1901
Lee, Richard Henry .....	1904	Merrell, Hubert Spencer .....	1903
Nie, Henry Joseph .....	1905	Meyer, Theodore Frederick .....	1901
Whitney, David Victory .....	1903	Miller, Charles Elliott .....	1899
Wirthman, John George .....	1903	Morris, George A. ....	1908
Wirthman, Joseph Charles .....	1903	Noll, Martin James .....	1898
<i>Linn Creek.</i>		Pauley, Frank Charles .....	1879
Moulder, Bettie Leona .....	1905	Perry, Frank Vinton .....	1907
<i>Marysville.</i>		Queeny, John Francis .....	1905
Orear, Edwin George .....	1904	Reilly, Robert Charles .....	1901
<i>Mexico, Audrian Co.</i>		Riley, Cassius Marcellus .....	1901
LLEWELLYN, JOHN FREDERICK .....	1867	SANDER, ENNO .....	1858
Llewellyn, Frederick William .....	1908	SCHEFFER, HENRY WILLIAM .....	1863
<i>Nevada.</i>		Schlueter, Robert Ernst .....	1904
Ballagh, Wilfred Thomas .....	1901	Schoentbaler, John Paul .....	1901
Pierce, Fred .....	1903	Seitz, Lorenz Aloysius .....	1901
<i>New Madrid.</i>		Sennewald, Emil August .....	1900
Hummel, John Andrew .....	1901	Stolle, Henry Jasper .....	1903
<i>Sedalia.</i>		Sultan, Frederick William .....	1901
Bard, William Evans .....	1901	Sum, Francis .....	1904
SMITH, OTIS WILMER .....	1903	Suppan, Leo Richard August .....	1904
<i>St. Louis.</i>		Uhlich, Ferdinand Gottlieb .....	1881
Blakeslee, Louis George .....	1903	VORDICK, AUGUST HENRY .....	1874
BOEHM, SOLOMON .....	1871	Walbridge, Cyrus Packard .....	1901
Caspari, Charles Edward .....	1902	Wall, Otto Augustus .....	1884
Claus, Otto Ferdinand .....	1901	WHELPLEY, HENRY MILTON .....	1837
Duering, Henry Charles .....	1901	Wolff, Edward Henry .....	1901
Falk, John Charles .....	1900	<i>Vandalia.</i>	
Fischer, John Frederick Henry .....	1901	Johnson, Marcy Marion .....	1907
Fricke, Frederick Henry .....	1901	Morgan, Thomas, Jr. ....	1905
Gietner, Charles .....	1905	<i>Washington.</i>	
GOOD, JAMES MICHENER .....	1871	Gallenkamp, Edward William .....	1903
Grewe, Louis Frederick .....	1901	<i>Webb City.</i>	
Hagee, William Price .....	1901	Wright, Charles Lewis .....	1901
Hagenow, Theodore Frederick .....	1901	<i>Webster Groves, St Louis Co.</i>	
		Mueller, Ambrose .....	1894
		<i>Windsor, Henry Co.</i>	
		Wesner, Henry Clay .....	1901

MONTANA.

*Billings.*

Warren, Lee .....1907

*Butte.*

Rockefeller, Howard.....1900

*Livingston.*

Scheuber, Frank Augustus .....1905

NEBRASKA.

*Arlington.*

Weber, Don Caesar .....1908

*Auburn.*

Dort, Edward Harvey.....1903

*Central City.*

Lindley, Ira Willard .....1908

*Fairbury.*

Pease, Autumn Vine .....1893

*Fort Crook.*

Compton, Paul .....1906

*Fremont.*

Koss, Frank .....1907

Kreizinger, Carl Ludwig.....1907

*Grand Island.*

Baumann, Oscar.....1908

*Greeley.*

Clough, Frank Harrington .....1905

*Holdrege.*

Fink, Daniel Jacob .....1903

*Kearney.*

Hansen, Neils P.....1906

*Kenesaw.*

Mikkelsen, Niels .....1903

*Lincoln.*

Haschenburger, Edmund Ommen ....1907

Lyman, Rufus Ashley .....1908

*McCook.*

McConnell, Lewis William .....1904

*Oakland.*

Simon, Frank.....1907

*Omaha.*

Bexten, Edward William].....1908

Cermak, Emil .....1908

Mares, Ferdinand Louis .....1897

Myers, Preston Brown.....1897

Sherman, Charles Rollin.....1889

Thorp, Edmund .....1908

*Plattsburgh.*

Fricke, Frederick George .....1903

Gering, Henry R.....1907

*Superior.*

Kendall, Wallace Warren.....1903

*Wynot.*

Schulte, Alexander, Jr.....1908

NEVADA.

*Tonopah.*

Piercy, Joseph Clifton .....1908

NEW HAMPSHIRE.

*Berlin.*

Lyford, Earle Howard.....1903

*Hillsboro.*

Moxley, Roland R. ....1907

*Manchester.*

Knowlton, George Harry.....1907

*Portsmouth.*

Grace, William Day.....1896

Green, Benjamin .....1888

*Somersworth.*

Hurd, John Charles.....1892

*West Derry.*

Bell, Samuel Howard.....1890

NEW JERSEY.

*Atlantic City.*

Deakyne, Harry Hartup.....1905

Dulaney, Joseph Field.....1902

Jackson, Charles Henry .....1907

Ridgway, William Frederick .....1902

Wescott, William Carter .....1896

*Bernardsville.*

Squibb, Charles Fellows .....1901

*Bloomfield, Essex Co.*

GARDNER, ROBERT WINSLOW.....1867

<i>Bridgeton.</i>		<i>Keyport.</i>	
Dare, Charles Ford .....	1889	Warn, William Edgar .....	1886
Jorden, Henry Albert .....	1902	<i>Lakewood, Ocean Co.</i>	
Whipple, George Henry .....	1902	Harrison, William John .....	1896
<i>Camden.</i>		<i>Linden.</i>	
Barrett, Charles Llewellyn .....	1902	Dougherty, Samuel Edward .....	1875
Beringer, George Mahlon .....	1893	<i>Malawan, Monmouth Co.</i>	
Beringer, George Mahlon, Jr. ....	1905	Slater, Frank Hovey .....	1882
Weiser, William Peiffer .....	1902	<i>Medford.</i>	
<i>Collingswood.</i>		Thorn, Henry Prickett .....	1879
Chamberlin, William Allan .....	1906	<i>Milburn.</i>	
Vanderkleed, Charles Edwin .....	1902	Campbell, George Stelle .....	1905
<i>East Orange.</i>		<i>Montclair.</i>	
Williams, Seward Whiting .....	1887	Dohme, William Ignatius .....	1907
<i>Elizabeth.</i>		Wrensch, Henry Ernest, Jr. ....	1902
FROHWEIN, RICHARD .....	1867	<i>Morristown.</i>	
Kent, Henry Avery, Jr. ....	1880	CARRELL, EUGENE AYRES .....	1875
Oliver, William Murray .....	1875	<i>Newark.</i>	
Schmidt, Henry .....	1904	Bear, Pierce B .....	1905
Stutzlen, Frank Charles .....	1902	Eckert, John .....	1902
<i>Englewood.</i>		Foster, John Benjamin .....	1901
Brown, Lewis W. ....	1907	Hain, Frank William August .....	1905
<i>Fort Hancock.</i>		HOLZHAUER, CHARLES .....	1873
Kauffman, Emmett Clarence .....	1907	Holzhauser, Charles William .....	1907
<i>Fort Lee.</i>		Menk, Charles William .....	1898
Kaiser, Herman W. ....	1907	Sayre, Edward Augustus .....	1877
<i>Haddonfield.</i>		Smith, Clarence Pennington .....	1890
Willard, Rowland .....	1902	Stahle, Louis Lorenz .....	1898
<i>Hoboken.</i>		Stanford, William Harrison .....	1876
KLUSSMANN, HERMANN .....	1876	Wuenssch, Charles .....	1898
Sieker, Ferdinand August .....	1893	<i>New Brunswick.</i>	
<i>Ironia.</i>		KILMER, FREDERICK BARNETT .....	1886
Coleman, John H. ....	1902	Rust, Schuyler Scott .....	1905
<i>Jersey City.</i>		<i>Orange.</i>	
Abernethy, Maxwell .....	1865	Behrens, John Frederick .....	1908
Gallagher, John Charles .....	1893	<i>Paterson.</i>	
Lohmann, Herman J. ....	1896	Mackey, James Campbell .....	1905
Stein, Edward Theodore North .....	1902	<i>Perth Amboy.</i>	
<i>Jersey City Heights.</i>		Parisen, George Warren .....	1892
Bongartz, Ferdinand Alphonse .....	1905	Seaman, Frederick Anthony .....	1905
Foulke, James .....	1881	<i>Phillipsburg.</i>	
Kuehne, Charles .....	1902	Anewalt, Ellsworth Quincy .....	1901
<i>Kearny.</i>			
Shaak, Franklin Philip .....	1906		

*Plainfield.*

Schreiner, Robert.....1906

*Red Bank.*

Van Derveer, Robert Hutchinson.....1903

*Roebling.*

Hires, Lewis Moore.....1907

*South Amboy.*

JACQUES, GEORGE WASHINGTON.....1869

*South Orange.*

Feindt, Louis F.....1906

*Verona, Essex Co.*

Rich, William Pitt.....1902

*Vineland.*

Newcomb, Edwin Leigh.....1906

*West Hoboken.*

Maggio, James Innocenzo.....1907

Neu, Daniel Alfred.....1903

Taborelli, Ernest Thomas.....1908

NEW MEXICO.

*Albuquerque.*

Ruppe, Bernard Charles.....1908

*Fort Stanton.*

Bell, John Michael.....1908

Ott, Clarence Roy.....1908

Van Ness, George Ide.....1904

NEW YORK.

*Albany.*

Bradley, Theodore James.....1896

Bradt, Warren Lansing.....1903

Dillenback, Garet Van der Veer.....1902

Gaus, Charles Henry.....1879

Husted, Alfred Birch.....1879

Michaelis, Gustavus.....1882

Taylor, Henry Lewis.....1906

*Auburn.*

Adams, Arthur Ellison.....1902

Sears, Charles Barager.....1906

*Bayside, L. I.*

Gregorius, William Paul.....1907

*Binghamton.*

Nelson, Burt Everett.....1902

*Brooklyn.*

Anderson, William Christine.....1900

Bartley, Elias Hudson.....1893

Brooks, George Washington.....1879

Cantor, Lorentz.....1907

*DeForest, William Pendleton*.....1879

DeJonge, Cornelius.....1899

Dewender, William Henry.....1896

Dissoaway, Thurston N.....1905

DUNN, JOHN AUGUSTUS.....1867

Eccles, Robert Gibson.....1885

Fischer, Albert.....1904

FOUGERA, EDMUND CHARLES HENRY.....1890

Kleine, Oscar Clemens, Jr.....1903

May, Louis.....1902

McElhenic, Thomas DeArmond.....1872

McMahon, Joseph.....1897

Muir, William.....1907

Myerson, Isaac Aaron.....1906

OWENS, RICHARD JOHN.....1860

Raubenheimer, Otto.....1902

Rosenzweig, Benjamin.....1898

Schaak, Milton Franklin.....1906

*Snyder, Ambrose Chancellor*.....1867

Stenbuck, Moses Abraham.....1907

Tuthill, Frederic Percival.....1899

Warner, Louis Henry.....1907

Webber, Joseph LeRoy.....1886

Werner, Rudolph Carl.....1882

Wicks, Otto.....1907

Wyckoff, Elmer Ellsworth.....1906

*Buffalo.*

Bentz, Henry George.....1904

Dimond, Harry John.....1904

Gregory, Willis George.....1886

Hayes, Horace Phillips.....1880

*Rano, Charles Orlando*.....1866

Reimann, George.....1902

Richardson, Samuel William.....1897

Stoddart, Thomas.....1900

*Cambridge.*

Richardson, Frank.....1906

*Catskill.*

DuBois, William Laneman.....1880

*College Point.*

Hartz, Johann Daniel August.....1902

Klein, Edward Nichols Emil.....1905

*Corning.*

Cole, Victor Le Roy.....1890

<i>Dannemora.</i>		Duble, Jesse Balderston .....	1904
Sloss, Robert Audley. ....		Elliott, Boyce .....	1906
<i>Dunkirk.</i>		Ennis, Ephraim Leonard .....	1906
Davis, Eugene Miller .....		Erhart, William Hermann .....	1907
<i>Ellis Island.</i>		Evans, William James .....	1904
Macdowell, William Foster .....		Fairchild, Benjamin Thomas .....	1875
O'Gorman, Theophilus Vincent .....		Fairchild, Samuel William .....	1887
<i>Elmira.</i>		Ferguson, George Albert .....	1905
HOLMES, CLAYTON WOOD. ....		Flowers, Hiland .....	1904
<i>Flushing.</i>		Fraser, Horatio Nelson .....	1888
Hepburn, John .....		Gable, Ralph Benton .....	1902
<i>Geneseo, Livingston Co.</i>		Gane, Eustace Harold .....	1895
Rogers, Arthur Henry .....		Geisler, Joseph Frank .....	1889
<i>Middletown.</i>		Green, Edward T. ....	1905
KING, JAMES THEODORE .....		Gregorius, George Gustavus Chas. Wm. ....	1898
ROGERS, WILLIAM HENRY .....		Hackenberger, George Washington ..	1907
Shimer, Samuel Mortimer .....		Haddad, Saleem Faris .....	1902
<i>Monticello.</i>		Hamann, William Augustus .....	1907
Isakovics, Alois von .....		Harkany, Samuel .....	1907
<i>Moravia.</i>		Harrison, Henry .....	1906
Hawley, Ralph Wright .....		Hatcher, Robert Anthony .....	1905
<i>Mount Vernon.</i>		Hauenstein, William .....	1883
Rauschenberg, Sidney .....		HAYNES, DAVID OLIPHANT .....	1887
Stone, Clarence George .....		Hays, Francis Banks .....	1902
<i>New York City.</i>		Henning, Adolph .....	1905
Allison, William Outis .....		HEYDENREICH, EMILE .....	1867
Alpers, William Charles .....		Hirseman, Felix .....	1907
Balser, Gustavus .....		Hitchcock, George Henry .....	1902
Baltzly, Albert Bates .....		Hopkins, Jesse L. ....	1898
Beilstein, Christian .....		Hudnut, Richard Alexander .....	1899
Berger, Louis .....		Jungmann, Julius .....	1879
Bigelow, Clarence Otis .....		Kalish, Oscar G. ....	1900
BILLINGS, HENRY MERRY .....		Kantrowitz, Hugo .....	1907
Boeddiker, Otto .....		Keenan, Thomas John .....	1894
Brucker, Carl Friederich Jacob .....		Kemp, Edward .....	1903
CHANDLER, CHARLES FREDERIC .....		KENNEDY, EZRA JOSEPH .....	1887
Coblentz, Virgil .....		Kirchgasser, William Charles .....	1888
Cohn, Alfred I. ....		Koch, William Julius .....	1907
Cook, Thomas Penrose .....		Lampa, Robert Raymond .....	1892
Craig, Hugh .....		Lascoff, Jacob Leon .....	1903
Daggett, Volney Chapin .....		Latham, Thomas .....	1907
Diamond, Peter .....		Lovis, Henry Christian .....	1892
Dieden, Frank Xavier .....		MAIN, THOMAS FRANCIS .....	1872
Diekman, George Charles .....		Mansfield, William .....	1907
Diner, Jacob .....		Mariamsun, Max .....	1902
		Mayer, Joseph L. ....	1905
		Mayo, Caswell Armstrong .....	1893
		McCoy, James Edward .....	1907
		McINTYRE, EWEN .....	1873
		McINTYRE, EWEN, Jr. ....	1903
		McKesson, Donald .....	1906
		McKesson, George Clinton .....	1888

McKesson, John, Jr .....	1867
<i>Motwitz, Ernst</i> .....	1867
Moore, Thomas Henry .....	1907
Murray, Benjamin Lindley .....	1896
Niece, Frederic Ellwood .....	1903
O'Neil, Henry Maurice .....	1879
Pfaff, Edward Franz .....	1907
Plaut, Albert .....	1894
Quackinbush, Benjamin Franklin ...	1886
Ramsdell, Clifford .....	1907
Ramsey, George .....	1907
RAMSPERGER, GUSTAVUS .....	1860
Rippetoe, John Ross .....	1907
Robinson, William Josephus Marir ...	1902
Roenne, Paul Ludwig .....	1908
RUNYON, EDWARD WHEELOCK .....	1875
Rusby, Henry Hurd .....	1890
Sacks, Bernard .....	1907
Sahn, Louis Napoleon .....	1905
Schenck, Henry .....	1903
Schieffelin, William J. ....	1892
Schimpf, Henry William .....	1894
Schleussner, Charles Frederick .....	1902
Schmid, Henry .....	1887
Schnell, Harry Julius .....	1906
Schweinfurth, George Edward .....	1907
Scott, Harry .....	1907
SKELLY, JAMES JOSEPH .....	1866
Spring, George Alexander .....	1907
Stephenson, John Joseph .....	1905
Takamine, Jokichi .....	1898
Weicker, Theodore .....	1905
Weinstein, Abraham .....	1904
Weinstein, Joseph .....	1905
Weiss, Emil Otto .....	1907
White, Charles Hugh .....	1902
WICKHAM, WILLIAM HULL .....	1870
Wilson, William Henry .....	1907
Wimmer, Curt Paul .....	1907
Wolff, Gustave .....	1903
Wooyenaka, Keizo .....	1907

*Plattsburg.*

Hitchcock, John E. ....	1892
-------------------------	------

*Saratoga Springs.*

FISH, CHARLES FREDERICK .....	1866
-------------------------------	------

*Stapleton, Staten Island.*

Becker, Ulrich William .....	1904
Roehrig, Albert Michael .....	1902

*Syracuse.*

Dawson, Edward Seymour, Jr. ....	1876
Muench, William .....	1899
Smith, Rufus E. ....	1907
Snow, Charles Wesley .....	1876

*Utica.*

Blaikie, William .....	1879
Evans, Arthur S. ....	1907
Slauson, John Gordon .....	1907
Watson, William, Jr. ....	1902

*Yonkers.*

Petsche, Franz Fried. Bismarck Wilhelm.	1892
---	------

## NORTH CAROLINA.

*Asheville.*

Pfafflin, Henry Adolph .....	1892
Raysor, Cornelius Ayer .....	1908

*Chapel Hill.*

Howell, Edward Vernon .....	1900
-----------------------------	------

*China Grove.*

Swaringen, DeWitt Clinton .....	1905
---------------------------------	------

*Durham, Orange Co.*

Vaughan, Parry Wyche .....	1882
----------------------------	------

*Fayetteville.*

Horne, Warren Winslow .....	1902
-----------------------------	------

*Kinston.*

Hood, William Dameron .....	1905
-----------------------------	------

*Raleigh.*

Sprague, John Frederick .....	1908
-------------------------------	------

*Rowland.*

Ward, Homer Benjamin .....	1901
----------------------------	------

*Sanford.*

Reid, William Watts .....	1906
---------------------------	------

*Tarboro.*

ZOELLER, EDWARD VICTOR .....	1878
------------------------------	------

*Tryon.*

Oliveros, Sidney Alphonse .....	1907
---------------------------------	------

*Williamston.*

Biggs, Warren H. ....	1905
-----------------------	------

*Wilmington.*

Hardin, John Haywood .....	1881
----------------------------	------

*Winston-Salem.*

McArthur, Robert Milton.....1908

## NORTH DAKOTA.

*Fargo.*

Wilser, Joseph Michael Stephen .....1906

*Grafton.*

Haussamen, Henry Louis.....1906

*Mandan.*

Bromme, William Louis.....1907

*Sharon.*

Simmons, Gustav Tobias.....1903

*Valley City.*

Siegfried, Henry J. ....1905

## OHIO.

*Ada.*

Mohler, David Christian... ..1906

*Akron.*

Collins, Frank Askew .....1906

Dutt, William. ....1905

Harper, Charles Bennett .....1904

Lemasters, William Otterbein.....1905

*Ashtabula.*

Allen, Andrew Campbell.....1905

*Barnesville.*

Ely, Ernest Sykes.....1904

*Bellevue.*

Brinker, John Henry.....1906

*Canton.*

Roth, Charles Robert .....1900

Schlabach, Edward John .....1904

*Chardon.*

Gape, Arthur Garfield.....1904

*Chillicothe.*

Howson, Arthur Bayshawe... ..1886

*Cincinnati.*

Apmeyer, Chares Ascau.....1906

Brand, Joseph Henry. ....1904

Drackett, Philip Wilbur.....1908

Fennel, Charles Theodore Piderit....1886

Fieber, Gustavus Adolphus .....1893

Forbes, James Winchell.....1905

Freericks, Frank Herman. ....1905

Gansz, Willam Henry.....1905

Gordon, William John Maclester....1854

Greyer, Julius. ....1880

Katz, Otto.....1904

Kisker, Frederick William .....1906

Kutchbauch, John Frederick .....1904

LLOYD, JOHN URI.....1870

Merrill, Charles George.....1888

Merrell, George.....1879

Overbeck, Bernard Henry, Jr.....1906

Serodino, Herman.....1880

Stier, George F.....1907

Voss, Edward, Jr .....1904

Wetterstroem, Theodore David .....1897

YORSTON, MATTHEW MACKAY.....1864

Zuenkeler, John Ferdinand .....1887

*Circleville.*

Fickardt, Frederick Lutz.....1904

*Cleveland.*

Army, Harry Vin.....1891

Bechberger, Henry .....1904

Benfield, Charles William.....1893

Benfield, Walter Edwin .....1908

Boldt, Frederick William.....1905

Brown, Charles Malvern.....1902

Cobb, Ralph Lathrop.....1883

Feil, Joseph.....1885

Fischer, Henry John. ....1902

Fox, Willard Milton.....1903

Graebner, Otto Henry.....1907

Haake, William Henry. ....1893

Hankey, William Tabor.....1902

Hannan, Owen Burdette.....1893

Hechler, Edward Henry.....1904

Hopp, Lewis Christopher.....1876

Krause, John .....1906

Krejci, Leo Charles .....1907

Kuder, William Frank.....1893

Lehr, Philip .....1885

Matousek, James Thomas.....1905

McDonald, Walter David .....1905

Miller, Frederick John .....1902

Mitermiller, John Alfred .....1903

Muhlhan, Otto Emil .....1905

Placak, Harry.....1902

Pratt, Thomas Matthew .....1906

Rosenberg, Samuel Solomon ....1907

Schellentrager, Ernest August .....1906

Schmitt, Carl.....1906



Schoenhut, Christian Henry ..... 1888  
 Selzer, Eugene Reinhold ..... 1893  
 Sherwood, Henry Jackson ..... 1894  
 Sieplein, Charles Augustus ..... 1904  
 Sorda, Thomas Vincent ..... 1893  
 Southard, Frank Allan ..... 1903  
 Tielke, Maxwell Gustave ..... 1904

*Columbiana.*

Ink, Charles Elliott ..... 1885

*Columbus.*

Ackerman, Philip Jacob ..... 1906  
 Baigent, John T. .... 1906  
 Dye, Clair Albert ..... 1901  
 Haney, Thomas Carlyle ..... 1903  
 Hatton, Ellmore Wright ..... 1894  
 Herpich, John Le Dure ..... 1906  
 Kaemmerer, William Frederick ..... 1899  
 Kauffman, George Beecher ..... 1882  
 Kiler, Abdel William ..... 1908  
 MATSON, GEORGE HIRAM, JR. .... 1869  
 Ogier, William Robert ..... 1901  
 Rauschkolb, John ..... 1894  
 Sauerbrun, Otto Orville ..... 1905  
 Schueller, Frederick William ..... 1880  
 Webb, Edward Nathan ..... 1905  
 Wendt, William Carl ..... 1901

*Conneaut, Ashtabula Co.*

Symonds, Arthur Henry ..... 1892

*Dalton.*

White, Albert J. .... 1907

*East Liverpool.*

Holloway, Jesse Daniel ..... 1905

*Grand Rapids, Wood Co.*

THURSTON, AZOR ..... 1886

*Hillsboro.*

Garrett, Oscar Newton ..... 1902

*Hopedale.*

Stringer, Orum Hines ..... 1905

*Logan.*

Harrington, Frank ..... 1869

*Massillon.*

Baltzly, Zachariah Taylor ..... 1905

*Navarre.*

GROSSKLAUSS, JOHN FERDINAND .... 1859

*Newark.*

Stanbarger, Morris Howard ..... 1906

*New Philadelphia.*

Schlup, Samuel, Jr. .... 1908

*Norwood.*

Bunnell, Lynn Lester ..... 1906

*Pomeroy.*

Roush, Frederick Alman ..... 1905

*Ripley.*

Crook, Frank Richards ..... 1905

*Sandusky.*

Biehl, Lewis A. .... 1908

*Scio.*

Beal, George Denton ..... 1907

Beal, James Hartley ..... 1892

Creighton, Mary Louisa ..... 1903

*Springfield.*

Siegenthaler, Harvey Newton ..... 1882

*Toledo.*

Bowman, Waldo Moffett ..... 1905

Huston, Thomas Benton ..... 1904

Huston, Thomas William ..... 1908

Lembke, Carl Henry Frank ..... 1907

Loesser, Paul A. .... 1906

Ludwig, William Edward ..... 1904

*Upper Sandusky.*

Von Stein, John Henry ..... 1904

*Washington.*

Warfield, James Allen ..... 1905

*Waverly.*

Dean, Augustus Horace ..... 1908

*Wooster.*

OHLIGER, LOUIS PHILIP ..... 1871

*Youngstown.*

Cassaday, Orlin Ulysses ..... 1899

*Zanesville.*

Highfield, Herbert Monroe ..... 1908

## OKLAHOMA.

*Carnegie.*

Bailey, William Edgar ..... 1906

*Checotah.*

Kniseley, Herman Dee.....1905

*Durant.*

Schenk, Fannie Kennedy (Mrs.) ....1906

*Edmond.*

Loster, John Wesley .....1908

*Guthrie.*

Lillie, Forest Ball.....1900

Spangler, Newton Light.....1906

*Hennesey.*

Dinkler, Frank Adam.....1900

*Lexington.*

Johnston, George Pembroke .....1905

*Medford.*

Neal, Thomas Lindsey .....1904

*Norman.*

De Barr, Edwin.....1905

Washburn, Homer Charles.....1905

*Shawnee.*

Clark, Arthur Benjamin .....1906

Machenheimer, Don Grover.....1906

*Stroud.*

Burton, John Clement.....1902

*Sulphur.*

McGinnis, E. K.....1908

## OREGON.

*Marshfield.*

Brown, James Lee .....1903

*Oregon City.*

Huntley, Clyde Gibson .....1904

*Portland.*

Laue, John Max Alfred. ....1904

Pozzi, Frank Camillo.....1908

Robertson, Felix Otey.....1890

*Salem.*

Harbord, Kittie Walker .....1905

*The Dalles.*

Blakeley, George Clarence .....1892

*Union.*

Reuter, Walter Henry.....1907

## PENNSYLVANIA.

*Allegheny City.*

Gleghorn, James Seymour .....1900

Sample, Oliver Hazen .....1907

Walter, Peter G.....1905

*Ardmore.*

Morse, Horace Binney .....1908

*Bellevue.*

Young, David Boyer .....1908

*Braddock.*

Kutscher, George William .....1905

Latou, William L.....1908

Minesinger, Norman Wilhelm .....1906

*Brownsville.*

Graham, Charles Robert.....1906

*Canonsburg.*

Morron, George Shattuck.....1905

*Carlisle.*

Horn, Wilbur Fisk .....1876

*Chambersburg.*

Greenawalt, S. Miller.....1907

*Charleroi.*

Gruen, John George .....1906

*Columbia.*

Zeamer Harry Wisler.....1905

*Connellsville.*

Berryhill, Henry Pennick. ....1890

*Crafton.*

Holsopple, J. Bert.....1905

*Du Bois.*

Hay, Charles La Mar .....1898

*East Pittsburg.*

Young, Harry Garfield .....1905

*Easton.*

Anspach, Paul Bucher.....1903

Voorhees, Harry Burns .....1906

*Edwardsdale.*

Lohmann, John.....1904

*Elkins Park.*

Osborne, Melmoth Mercer .....1906

*Harrisburg.*

GEORGE, CHARLES THEODORE .....1873  
 Gorgas, George Albert.....1884  
 Smith, Benjamin Franklin.....1892

*Harrisville.*

Cochran, William Medardus. ....1906

*Hatboro.*

Rothwell, Walter.....1907

*Haverford.*

Harbaugh, Wilson Linn .....1896

*Homestead.*

Hantz, Charles Nelson .....1906

*Houtzdale.*

Arnold, William Charles.....1908

*Jefferson, Greene Co.*

McGovern, John Francis.....1906

*Johnstown.*

Griffith, Charles.....1900  
 Griffith, James Arthur.....1905

*Lancaster.*

Frailey, William Otterbein .....1903  
 Heinitch, Sigmund William .....1889  
 Shaub, Jacob Raymond....1908

*Langhorne.*

HANCOCK, CHARLES WEST.....1868

*Lebanon.*

LEMBERGER, JOSEPH LYON.....1858  
 Redsecker, Jacob Henry.....1881

*Lititz.*

Moyer, Lewis Nathan .....1903

*Manheim, Lancaster Co.*

Ruhl, Harry Fry.....1902

*Mars.*

Willets, Charles Ellsworth .....1905

*Meadville.*

Utech, Philip Henry .....1907

*Media.*

Meeker, George Herbert.....1905

*Mt. Joy, Lancaster Co.*

Garber, Elmer Franklin Weaver.....1901

*New Castle.*

Douglas, Austin Earl. ....1908  
 Wallace, John Crawford.....1905

*Norristown.*

Reed, Willoughby Henry.....1893

*Ogonts.*

Clayton, Abraham Theophilus.....1906

*Oil City.*

Gaddess, John .....1908  
 Gaddess, Thomas.....1908

*Philadelphia.*

Apple, Franklin Muhlenberg .....1905  
 Baer, Jacob Michael .....1902  
 BAUER, LOUIS GUSTAVUS .....1867  
 Bell, Robert Nevens ....1905  
 Blackwood, Russell Thorn ...1907  
 Blair, Henry Cowan.....1907  
 Bonta, Clarence LaRue.....1906  
 Borell, Henry Augustus .....1874  
 BORING, EDWARD MCCURDY .....1867  
 Bradshaw, Henry A. ....1908  
 Brinton, Clement Starr ....1907  
 Burg, John Dellinger.....1888  
 Burck, William Thompson.....1906  
 Busch, Miers.....1903  
 Cadmus, Robert Clark.....1906  
 Cameron, Charles Sherwood .....1906  
 Campbell, Milton.....1902  
 Campbell, Theodore .....1902  
 Clapham, Hesser Charles .....1907  
 Cliffe, William Lincoln .....1898  
 Conover, Samuel Harry.....1908  
 Cook, Ernest Fullerton .....1901  
 Crawford, Joseph .....1903  
 Cutbber, Richard William .....1906  
 Decker, William Robert .....1907  
 Eberly, Frank Hertzler.....1907  
 Ellis, Evan Tyson .....1857  
 England, Joseph Winters .....1893  
 Eppstein, Jacob .....1902  
 Evans, George Bryan.....1902  
 Feidt, George David .....1898  
 Finney, John Joseph .....1906  
 FOX, PETER PAUL..1869  
 French, Harry Banks .....1890  
 French, Howard Barclay.....1906  
 Gabell, Cromwell Pearce.....1907  
 Gano, William Hubbell .....1892  
 Goldberg, Joseph.....1908

Graham, Willard . . . . .	1902	MOORE, JOACHIM BRICKLEY . . . . .	1860
Greenawalt, William Grant . . . . .	1907	Morgan, Frank E. . . . .	1906
Hance, Anthony Miskey . . . . .	1902	MORRIS, LEMUEL IORWERTH . . . . .	1880
HANCE, EDWARD HANCE . . . . .	1857	Mulford, Henry Kendall . . . . .	1896
Harbold, Curtis Alexander . . . . .	1907	Nebig, William George . . . . .	1907
Harbold, John Tilden . . . . .	1905	Oettinger, Albert . . . . .	1902
Hassinger, Samuel Eliphath Reed . . . . .	1880	Oliver, Frank Murphy . . . . .	1906
Haussmann, Frederick William . . . . .	1895	Osterlund, Otto William . . . . .	1902
Haydock, Susannah Garrigues . . . . .	1905	Ottinger, James Jeremiah . . . . .	1876
Heim, William Joseph . . . . .	1902	Pachili, Theodore, Jr. . . . .	1907
<i>Heintzelman, Joseph Augustus</i> . . . . .	1858	Peacock, Bertha Leon (Mrs.) . . . . .	1895
High, Raymond Lightcap . . . . .	1902	Peacock, Josiah Comegys . . . . .	1892
Hinton, Rufus Guy . . . . .	1905	Pearson, William Alexander . . . . .	1908
Hoch, Aquilla . . . . .	1896	Pile, Gustavus . . . . .	1881
Hoch, Quintus . . . . .	1907	Poley, Warren Henry . . . . .	1906
Hughes, Francis Stackner . . . . .	1902	Pollard, Augustus Torrey . . . . .	1906
Hunsberger, Ambrose . . . . .	1905	Potts, David Gardner . . . . .	1893
Kahn, Solomon Karl . . . . .	1905	Rauff, U. Gilbert . . . . .	1907
Kelley, John J. . . . .	1905	Reese, David John . . . . .	1906
Kercher, Edwin Harry . . . . .	1907	Rehfuß, Charles . . . . .	1908
Kimberly, Charles Hubbell . . . . .	1908	Remington, Joseph Percy . . . . .	1901
Kirk, Frank Hall . . . . .	1907	REMINGTON, JOSEPH PRICE . . . . .	1867
Kirk, Samuel Bird . . . . .	1907	Riegel, Samuel Jacob . . . . .	1905
Kline, Clarence Mahlon . . . . .	1902	Roach, Jeremiah Thomas . . . . .	1907
Kline, Mahlon Norwood . . . . .	1878	Rosengarten, George David . . . . .	1902
Koch, Christopher . . . . .	1907	Sadtler, Samuel Philip . . . . .	1893
KRAEMER, HENRY . . . . .	1892	Shafer, Erwin Clement . . . . .	1893
Kraus, Otto . . . . .	1906	Shoemaker, Clayton French . . . . .	1902
Lacey, William Henry . . . . .	1907	SHOEMAKER, RICHARD MARTIN . . . . .	1865
Lackey, Richard Henry . . . . .	1907	Siegfried, Howard J. . . . .	1907
Lautz, William Henry . . . . .	1908	Smith, Albert Henry . . . . .	1902
LaWall, Charles Herbert . . . . .	1896	Smith, Walter Valentine . . . . .	1902
LaWall, Millicent Renshaw (Mrs.) . . . . .	1905	Stanislaus, Ignatius Valerius Stanley . . . . .	1906
Lawrence, Henry Haydock . . . . .	1907	Staudt, Albert John . . . . .	1907
Lee, William Estell . . . . .	1905	Stewart, Francis Edward . . . . .	1884
Leedom, Charles . . . . .	1902	Streeper, Frank Park . . . . .	1907
Long, John Nathan Grier . . . . .	1906	Stroup, Freeman Preston . . . . .	1900
Lowe, Clement Belton . . . . .	1895	Swain, Harry . . . . .	1902
Marsden, Joshua Eugene . . . . .	1906	Thum, John Karl . . . . .	1905
Martin, Harry . . . . .	1908	Toplis, William George . . . . .	1905
Matusow, Harry . . . . .	1897	Turner, Joseph L. . . . .	1906
McCartney, Frank Stewart . . . . .	1908	Warner, William Richard, Jr. . . . .	1902
McConomy, Paul Lucien . . . . .	1906	WEIDEMANN, CHARLES ALEXANDER . . . . .	1868
McFerren, Jeremiah Dull . . . . .	1906	Weidemann, George Buzby . . . . .	1902
MCINTYRE, WILLIAM . . . . .	1868	Wendel, Henry Edward . . . . .	1873
McNeil, Robert . . . . .	1907	White, Robert Charles . . . . .	1906
<i>Mellor, Alfred</i> . . . . .	1864	<i>Wiegand, Thomas Snowden</i> . . . . .	1857
Mentzer, Harvey H. . . . .	1902	Wood, Horatio C., Jr. . . . .	1906
MILLER, ADOLPHUS WILLIAM . . . . .	1868		
Minehart, John Roy . . . . .	1905		
Moerk, Frank Xavier . . . . .	1898		
Monaghan, Thomas Francis . . . . .	1902		

## Pittsburg.

Bell, William Ray . . . . .	1906
Blank, Herman Gustave . . . . .	1905

Blumenschein, Frederick John. .... 1904  
 Bryson, William Smith. .... 1905  
 Dahlin, Horace Otto. .... 1905  
 EMANUEL, LOUIS. .... 1878  
 Evans, Harry Oliver Newton. .... 1908  
 Fawcett, Charles Emerson. .... 1905  
 Hoechstetter, Max Sigmund. .... 1908  
 Judd, Albert Floyd. .... 1901  
 Koch, Julius Arnold. .... 1892  
 Kossler, Herman Stanislaus. .... 1905  
 Krassnosky, Samuel. .... 1907  
 Moyer, Ray Paul. .... 1907  
 Muchnic, Adolph Morris. .... 1905  
 Myers, Charles Joseph. .... 1905  
 Patterson, Charles Meade. .... 1905  
 Pegg, Harry Wilson. .... 1908  
 Pietkiewitz, Wladyslav Lion. .... 1908  
 Ringer, Charles Elmer. .... 1905  
 Rodemoyer, William Edward. .... 1901  
 Saalbach, Louis. .... 1907  
 Scholz, William Frank. .... 1908  
 Thompson, John Reynolds. .... 1905  
 Weil, Albert Joseph. .... 1905

*Plumville.*

Green, James Blaine. .... 1905

*Pottsville.*

Deibert, Thomas Irwin. .... 1882

*Reading.*

Stein, Jacob Henry. .... 1902  
 Ziegler, Howard Philip. .... 1905  
 ZIEGLER, PHILIP MILTON. .... 1867

*Scranton.*

Davis, Emma May. .... 1905  
 Thomas, Daniel Judson. .... 1905

*Sharpsburg.*

Stech, George Oscar, Jr. .... 1908

*Swissvale.*

Johnson, Ralph Henry. .... 1901

*Towanda.*

PORTER, HENRY CARROLL. .... 1872

*Turtle Creek.*

Bandy, Lewis Abram. .... 1908

*Washington.*

McConaghy, Thomas Singleton. .... 1905  
 Minton, Charles Newton. .... 1908  
 Vowell, Lewis Sweitzer. .... 1905

*Wilkinsburg.*

Berg, Albert Leonard. .... 1908  
 Hall, Guy P. .... 1905  
 Toner, Robert Thomas. .... 1908

*Williamsport.*

Cornell, Edward Augustus. .... 1873  
 Millener, William S. .... 1905  
 Smith, Edward W. .... 1902  
 Walton, Lucius Leedom. .... 1904

*York.*

Leber, Jacob Gilbert. .... 1905  
 Patton, John Franklin. .... 1880

## PHILIPPINE ISLANDS.

*Benquet.*

Hamner, James Faris. .... 1906

*Manila.*

Comfort, Newton C. .... 1904  
 Guerrero, Leon Maria. .... 1904  
 Van Sickle, George Campbell. .... 1906  
 Zamora, Manuel. .... 1908

*Zamboanga.*

Askew, Alfred Joseph. .... 1905  
 Perry, Clifford Henry. .... 1906

## RHODE ISLAND.

*Naragansett Pier.*

Tobin, John Martin. .... 1887

*Newport.*

Downing, Benjamin Franklin, Jr. .... 1886  
 Kalkman, Henry Alfred. .... 1907  
 Pearson, Joseph Frederick. .... 1897  
 Wood, John William. .... 1897

*Providence.*

Blanding, William Oliver. .... 1894  
 Crawford, Frank Eugene. .... 1902  
 Greene, William Ray. .... 1883  
 O'Hare, James. .... 1888  
 Pearce, Howard Anthony. .... 1894  
 Strickland, Franklin Nelson. .... 1905

*Westerly.*

Collins, Albert Burlingame. .... 1882

*Woonsocket.*

Jackson, Frank Anthony.....1900  
 Simmons, Frank Birtles .....1897

## SOUTH DAKOTA.

*Aberdeen.*

Woodward, Albert A. ....1906

*Alexandria.*

Baughman, Leo Melzer.....1907

*Arlington.*

Maxwell, Charles Coleman.....1906

*Brookings.*

Whitehead, Bower Thomas .....1908

*Colton.*

Lowry, George Warren.....1906

*Conde.*

Ross, Otto Ellsworth .....1908

*Dell Rapids.*

Bent, Edward Clarence.....1905

*Geddes.*

Pinaud, Pierre Romeo.....1908

*Lake Preston.*

Keith, Irwin Alonzo.....1906

*Mitchell.*

Scaulin, Stephen H.....1906

*Sioux Falls.*

Dunning, Lyman Taylor.....1906

*Tyndall.*

Cotton, Robert M.....1908

*Watertown.*

Jones, David Franklin.....1895

*Yankton.*

Brecht, Frederick Adolph.....1895

Wallhaun, Carl G.....1907

## TENNESSEE.

*Bristol.*

Brishear, Owen Lee.....1906

*Chattanooga.*

Voigt, Joseph Frederick .....1893

*Knoxville.*

Rosenthal, David Abraham.....1894

*Memphis.*

Duntze, Francis Clarke, Jr.....1908  
 McBride, Charles Robert.....1904  
 ROBINSON, JAMES SCOTT.....1869  
 Sheehan, John S.....1907  
 Ward, Francis Watson.....1908

*Nashville.*

Burge, James Oscar .....1908  
 Holt, Lewis Herbert, Jr.....1907  
 Justice, J. Edwin .....1906  
 McGill, John Thomas .....1900  
 Ruddiman, Edsel Alexander.....1894  
 White, William Rufus.....1904

*Sharon.*

Shannon, Thomas J.....1905

## TEXAS.

*Brownsville.*

Willman, William George.....1904

*Corsicana.*

Coulson, James Thomas .....1906

*Dallas.*

Chisholm, Jesse Connor.....1906  
 Cormick, John William.....1906  
 De Lorenzi, Albert.....1890  
 Duncan, Chester Arthur .....1906  
 Eberle, Eugene Gustavus.....1896  
 Golaz, Ernest Henry .....1907  
 Schrodt, Jacob .....1903  
 Treadwell, William Pickens.....1906

*Denton.*

Allison, Samuel Porter.....1905

*Detroit.*

McGee, George .....1907

*El Paso.*

Hunter, Angus .....1906  
 Ryan, Ambrose Eugene.....1907  
 Weaver, John Alvin.....1906

*Fort Clark.*

Collins, John Lawrence .....1906

*Fort Worth.*

Covey, John Walker.....1908  
 Needham, Robert Hamilton.....1906  
 Stromberg, Eric William.....1908

*Galveston.*

Buckner, John Clark.....1905  
Cline, Raoul René Daniel.....1898  
Orton, Ingomar François.....1891  
Turk, Bascom Andrew.....1908

*Gonsales.*

Robertson, William Franklin.....1907  
Walker, Robert Hamilton.....1907

*Hallettsville.*

Saccar, Michael.....1905

*Houston.*

Burgheim, Jacob.....1892

*Hughes Springs.*

Glass, William Finis.....1904

*New Braunfels.*

Voelcker, Edwin Bruno.....1908

*Paris.*

Musselman, Claude J.....1906

*Saint Jo.*

Pedigo, Smith Christopher.....1907

*Thorndale.*

McDaniel, John Preuit.....1908

*Troupe.*

McKay, Felix Early.....1903

*Velasco.*

Roeller, Edward Frank.....1902

*Waelder, Gonsales Co.*

Brookes, Virginia Cade.....1901

UTAH.

*Brigham.*

Eddy, Wynn Leland.....1908

*Cedar City.*

Bladen, John Mount.....1908

*Ogden.*

Culley, John.....1908

*Provo City.*

Hedquist, Alexander.....1908

Hedquist, Francis J.....1908

Sutton, Arthur D.....1908

*Salt Lake City.*

Coffman, Walter Thomas....1904

Dayton, Walter Henry.....1908

Druehl, Frank August.....1908

Halliday, Thomas Law.....1908

Harms, Herman E.....1908

Harvey, Charles Julian.....1908

Irvine, Darwin William.....1902

Johnson, Joy Happy.....1908

Nelden, Ralph.....1908

Peters, Otto Rudolph.....1908

Schramm, Frederick Clement.....1908

Treasure, John T.....1908

VanDyke, Charles.....1908

Whitworth, Frank Edgar.....1908

*Smithfield.*

Colpin, Emanuel Edward.....1907

VERMONT.

*Barre.*

Davis, Daniel Frost.....1907

*Burlington.*

Zottman, William Henry.....1903

*Marshfield.*

Gilman, Elbridge Wheeler.....1907

*Montpelier.*

Slade, Henry Allen.....1899

Terrill, Willis Ethel.....1899

*Morrisville.*

Cheney, Arthur Lewis.....1907

*Newport.*

Bigelow, Charles Frederick.....1907

*St. Johnsbury.*

Bingham, Charles Calvin.....1875

VIRGINIA.

*Barton Heights.*

Miller, Roshier W.....1906

*Charlotte C. H.*

Williams, Walter Gregory.....1905

*Culpeper.*

Goldsborough, Charles Henry.....1898

*Harrisonburg.*

Avia, James Little.....1905

*Lynchaven.*

Schaefer, Emil August.....1900

*Norfolk.*

Martin, William Rogers.....1905  
 Nelligar, Frederic Dennis.....1907  
 Scott, Edward Burroughs.....1905

*Phoebus.*

Congdon, George Gardner .....1903

*Richmond.*

Brandia, Ernest Linwood .....1906  
 Briggs, Andrew Gessner .....1890  
 Curd, Thomas Nelson .....1907  
 Harrison, Robert Lucius.....1900  
 Miller, Turner Ashby.....1894  
 Scott, William Henry .....1873

*Roanoke.*

Barnes, Henry Cooper.....1905

*Suffolk.*

Hall, Joseph Patten.....1900

## WASHINGTON.

*La Conner, Skagit Co.*

Joergensen, Gerhard Johan Carl Sophus.1889

*Port Townsend.*

Kliemad, George .....1907  
 Rogers, Edward .... 1902  
 Rutz, Walter .....1908

*Pullman.*

Thompson, Mason L.....1908  
 Watt, George Henry .....1896

*Puyallup.*

Truedson, Eric Per.....1904

*Seattle.*

Aschermann, Gustav Singer .....1905  
 Guy, George Omar.....1908  
 Holmes, Henry Elliott.....1880  
 Johnson, Charles Willis.....1903  
 Lough, Thomas Warner .....1905  
 McCoughan, John Harold .....1908  
 Osseward, Cornelius.....1897  
 Vaughn, Patrick Henry.....1907  
 Watson, Joseph Ryerson.....1904

*Snohomish.*

Wilbur, Lot .....1896

*Spokane.*

McArthur, James W.....1904

*Tacoma.*

Gamer, Albert Charles C.....1902  
 Walker, Charles Henry.....1904

*Wilbur.*

Bandy, George .....1905

## WEST VIRGINIA.

*Bluefield.*

Crouch, William Tazewell. ....1906

*Buckhannon.*

Young, George Orvill .....1907

*Clarksburg.*

Haymaker, Frank Berkshire. ....1906

*Colliers.*

Robinson, Henry Sherman .....1905

*Harpers Ferry.*

Dittmeyer, Walter Eugene.....1907

*Majorsville.*

Dinamore, Warren. ....1908

*Parkersburg.*

Brown, Edward Preston .....1906

*Pine Grove.*

Morgan, Thomas Lee .....1907

*Sutton.*

Walker, Alfred.....1905

*Wheeling.*

Coleman, John .....1905  
 Dawson, Edward Bruce .....1907  
 Gordon, Wm. C.....1905

## WISCONSIN.

*Antigo.*

Gauthier, Charles Desiro... ..1906

*Eau Claire.*

Boberg, Otto Johan Sinus.....1903

*La Crosse.*

Beyschlag, Charles. ....1880  
 Hebbard, Edward Smith.....1907

*Madison.*

Fischer, Richard. ....1901  
 KREMERS, EDWARD.....1887  
 Lewis, Henry.....1908



Schulz, Raymond.....1907	<i>Neillsville.</i>
Wakeman, Nellie Antoinette .....1908	Sniteman, Charles Clarence.....1881
Williams, Edward.....1906	
<i>Milwaukee.</i>	<i>Oconomowoc.</i>
Brundage, Albert Harrison.....1892	Peters, Henry August .....1903
Dadd, Robert Morrow.....1896	
DRAKE, JOHN RANSOM.....1860	<i>Racine.</i>
Hill, Warren Brown .....1908	Horlick, Alexander James .....1904
Janssen, Jacob Solomon .....1903	Kradwell, Gustav A.....1908
Kettler, Edward, Jr.....1896	
Krembs, Ernest Maximilian .....1903	<i>Richland Center.</i>
Raeuber, Edward Gottfried.....1900	Allen, Huestus Benjamin.....1908
Ruenzel, Henry Gottlieb.....1892	
Schrank, Charles Henry.....1876	<i>Watertown.</i>
Spiegel, Adolph.....1905	Eberle, Arthur Ralph .....1907
	Eberle, Herman Theodore.....1901

## DOMINION OF CANADA.

<b>MANITOBA.</b>	<i>Stratford.</i>
<i>Winnipeg.</i>	WAUGH, GEORGE JAMES .....1862
Bletcher, Henry Ernest John.....1904	<i>Toronto.</i>
<b>NEW BRUNSWICK.</b>	Hargreaves, John.....1904
<i>St. John.</i>	Heebner, Charles Frederick.....1894
Paddock, Morris Venner.....1902	<b>QUEBEC.</b>
<b>NOVA SCOTIA.</b>	<i>Montreal.</i>
<i>Halifax.</i>	Lachance, Seraphin.....1888
Simson, Francis Cook .....1876	Morrison, Joseph Edward.....1888
<b>ONTARIO.</b>	<i>Quebec.</i>
<i>Guelph.</i>	Willis, Henry .....1897
Stewart, Alexander .....1905	<i>Three Rivers.</i>
<i>Ottawa.</i>	Williams, Richard Wellington.....1883
SAUNDERS, WILLIAM. ....1860	

MEMBERS RESIDING IN FOREIGN COUNTRIES (*except Canada*).

Abreu, Gerardo Fernandez, Havana, Cuba.....1907
Alacn, Jos Prxedes, Havana, Cuba .....1907
Bernstrm, Nils Gustaf, Gothenburg, Sweden .....1906
Biosca, Placido, Havana, Cuba .....1907
Bosque, Arturo, Havana, Cuba .....1907
Carpote, Jos, Havana, Cuba .....1907
Cartaya, Julio Hernandez, Havana, Cuba .....1907
Cuervo, Adolfo, Havana, Cuba .....1907
Curquejo, Antonio Gonzales, Havana, Cuba.....1907
Diaz, Jos Guillermo, Havana, Cuba.....1907
Fanoua, Amin, Fayoum, Egypt.....1907
Figuerola, Ernesto Valdes, Havana, Cuba .....1907
de Jongh, Pedro, Cardenas, Cuba.....1907

Hallaway, Robert Railton, Carlisle, England .....	1905
Herrera, Francisco, Havana, Cuba .....	1907
<i>Heyl, James Bell</i> , Hamilton, Bermuda .....	1863
Jacobs, Charles Christian, Havana, Cuba .....	1901
Johnson, Manuel, Havana, Cuba .....	1907
Ladakis, Triantaphyllo, Beirut, Syria .....	1907
Martin, Nicholas Henry, Gateshead-on-Tyne, England .....	1891
Martinez, Alfred, Havana, Cuba .....	1907
Mata y Acosta, Joaquin, Havana, Cuba .....	1907
McLarty, Colin, Yokohama, Japan .....	1898
Morales, Celestino Garcia, Havana, Cuba .....	1907
Moya, Carlos A., Havana, Cuba .....	1907
Murray, Alexander, San José de Costa Rica .....	1903
Padron, Thomas, Havana, Cuba .....	1907
Patch, James Alfred, Beirut, Syria .....	1903
Pedrosa, Manuel, Havana, Cuba .....	1907
Pirie, Alfred Mitchell, Cartago, Costa Rica .....	1903
POWER, FREDERICK BELDING, London, England .....	1872
Puig, Juan E., Havana, Cuba .....	1907
Sarra, Ernesto, Havana, Cuba .....	1907
Taquechel, Francisco, Havana, Cuba .....	1908
Valdes, Eduardo, Matanzas, Cuba .....	1907
WELLCOME, HENRY SOLOMON, London, England .....	1875

## MEMBERS WHOSE RESIDENCE IS UNKNOWN.

Barton, Willard Mortimer .....	1906
Cajulis y Samedra, Felix. ....	1907
Collins, Mary Elizabeth .....	1902
Crawford, Claude Marcelle .....	1906
Donaberger, Samuel Bricker .....	1906
Gale, William Henry .....	1857
Lawrence, George W. ....	1906
Lippy, George Henry .....	1906
Martin, Frank William .....	1906
Roll, Tod B. ....	1906
Schaffer, Charles .....	1903
Schneider, Benjamin .....	1907
Ware, Clarence Walter .....	1907
Williams, George Gorham .....	1888

NOTE.—Names of life members whose residence has been unknown for five consecutive years, are no longer published in the above list, in accordance with the action of the Council approved at the forty-eighth annual meeting. (See Proceedings, 1900, p. 18.)

## ALPHABETICAL LIST OF MEMBERS.

---

### HONORARY MEMBERS.

- Attfield, Dr. John, F. R. S., Watford, England.  
Carteighe, Michael, F. I. C., 180 New Bond St., London, W., England.  
Holmes, E. M., F. L. S., 17 Bloomsbury Square, London, W. C., England.  
Hooper, David, F. I. C., F. C. S., Indian Museum, 1 Sudder St., Calcutta, India.  
Schaer, Dr. Edward, Professor of Pharmacy, Pharmaceutisches Institut der Universität,  
Strassburg, Germany.  
Schmidt, Professor Dr. Ernst, Geh. Regierungsrath, Marburg, Germany.

## ACTIVE MEMBERS.

Members are requested to notify the General Secretary of errors or inaccuracies in the following list. The Association will not replace volumes of Proceedings lost through changes of residence of which the General Secretary has not been notified. See Proceedings, 1866, p. 66.

- |   |   |
|---|---|
| Abbett, Wm. A.,<br>201 W. Superior st., Duluth, Minn.                 | Anderson, Carl G.,<br>1111 E. 75th st., Chicago, Ill.           |
| Abernethy, John C.,<br>c. o. Biscayne Drug Co., Miami, Fla.           | Anderson, John C.,<br>202 Century Bldg., Denver, Colo.          |
| <i>Abernethy, Maxwell,</i><br>22 Brinkerhoff st., Jersey City, N. J.  | Anderson, William C.,<br>320 Lafayette ave., Brooklyn, N. Y.    |
| Abreu, Gerardo F.,<br>103 San Miguel st., Havana, Cuba.               | Andreen, Carl,<br>1504 4th st., Sioux City, Ia.                 |
| Ackerman, Philip J.,<br>549 N. High st., Columbus, O.                 | Anewalt, Ellsworth Q.,<br>140 S. Main st., Phillipsburg, N. J.  |
| Adamick, Gustave H.,<br>189 E. Madison st., Chicago, Ill.             | Anglum, John,<br>1463 Larimer st., Denver, Colo.                |
| Adams, Arthur E.,<br>16 Westlake ave., Auburn, N. Y.                  | Anspach, Paul B.,<br>334-336 Northampton st., Easton, Pa.       |
| Adams, James H.,<br>Commercial st., Provincetown, Mass.               | Apmeyer, Chas. A.,<br>cor. Sixth & Vine sts., Cincinnati, O.    |
| Adams, James O.,<br>1637 Second st., New Orleans, La.                 | Apple, Franklin M.,<br>cor. 31st & Berks st., Philadelphia, Pa. |
| Ade, Daniel A.,<br>109 Randolph st., Chicago, Ill.                    | Appleton, William R.,<br>Lock Box 162, Warren, Ark.             |
| Ahlborn, Frank H.,<br>1202 Bryn Mawr ave., Chicago, Ill.              | Arkin, James A.,<br>1661 Haight st., San Francisco, Cal.        |
| Alacán, José P.,<br>21 17th st., Vedado, Havana, Cuba.                | Arneson, Thomas,<br>Lock Box 21, Kennedy, Minn.                 |
| Alexander, Chas. E.,<br>Bur. Med. & Surg., Navy Dep., Washing'n, D.C. | Arnold, Wm. C.,<br>Houtzdale, Pa.                               |
| Allen, Andrew C.,<br>40 Depot st., Ashtabula, O.                      | Arny, Harry V.,<br>356 Superior st., Cleveland, O.              |
| Allen, E. Floyd,<br>1538 Nicollet ave., Minneapolis, Minn.            | Aschermann, Gustav S.,<br>University Station, Seattle, Wash.    |
| Allen, Huestus B.,<br>Richland Center, Wis.                           | Asher, Philip,<br>725 Camp st., New Orleans, La.                |
| Allison, Samuel P.,<br>Denton, Tex.                                   | Ashim, Barach J.,<br>610 Third st., San Francisco, Cal.         |
| Allison, William O.,<br>100 William st., New York, N. Y.              | Askew, Alfred J.,<br>Zamboanga, Mindanao, P. I.                 |
| Alpers, William C.,<br>495 Columbus ave., New York, N. Y.             | Atkins, Chas. W.,<br>Petoskey, Mich.                            |

- Avery, Charles H.,  
302 E. 55th st., Chicago, Ill.
- Averyt, Henry M.,  
426 Baldwin ave., Detroit, Mich.
- Avis, James I.,  
83 S. Main st., Harrisonburg, Va.
- Axness, Ole M.,  
Pelican Rapids, Otter Tail Co., Minn.
- Ayres, Albert J.,  
Mercer University, Macon, Ga.
- Ayres, Gold,  
England, Ark.
- Baas, George A.,  
Eatesville, Ind.
- Bachelle, Rudolph von,  
130 E. 43d st., Chicago, Ill.
- Bachman, Gustav,  
Coll Pharm., State Univ., Minneapolis, Minn.
- Bacon, Fphraim,  
402 Roland ave., Roland Park, Md.
- Baer, Edward A.,  
722 Market st., San Francisco, Cal.
- Baer, Jacob M.,  
2000 Chestnut st., Philadelphia, Pa.
- Baigent, John T.,  
Hosp. Columbus Barracks, Columbus, O.
- BAILEY, FREDERICK,  
P. O. Box 314, Lowell, Mass.
- Bailey, W. E.,  
Carnegie, Okla.
- Baily, G. Frank,  
28 S. Hanover st., Baltimore, Md.
- Baird, Julian W.,  
102 St. Botolph st., Boston, Mass.
- Baker, De Forest,  
300 E. 43d st., Kansas City, Mo.
- Baker, Edwin,  
Bridge st., Shelbourne Falls, Mass.
- Baker, Walter N.,  
400 Neponset ave., Boston, Mass.
- Baldauf, Julius L.,  
214 Main st., Henderson, Ky.
- Ballagh, Wilfred T.,  
S. E. cor. Square, Nevada, Mo.
- Ballard, Chas. W.,  
34 Morningside East, New York, N. Y.
- BALLARD, JOHN W.,  
106 W. 2d st., Davenport, Ia.
- Balser, Gustavus,  
137 Avenue B, New York, N. Y.
- Baltzly, Albert B.,  
2278 7th ave., New York, N. Y.
- Baltzly, Zachariah T.,  
12 Erie st., Massillon, O.
- Bancroft, Richard B.,  
310 Central ave., Hot Springs, Ark.
- Bandy, George,  
Wilbur, Wash.
- Bandy, Lewis A.,  
90 Penn ave., Turtle Creek, Pa.
- Bange, Otto F.,  
cor. 11th & German sts., Newport, Ky.
- Banks, Walter C.,  
1900 S. Main st., Los Angeles, Cal.
- Bard, Wm. E.,  
108 W. Main st., Sedalia, Mo.
- Barnard, Harry A.,  
171 Main st., Marlboro, Mass.
- Barnes, Chas. D.,  
801 Grand ave., Glenwood Springs, Colo.
- Barnes, Henry C.,  
2 S. Jefferson st., Roanoke, Va.
- Barnett, Joel J.,  
Care of Sharp & Dohme, Baltimore, Md.
- Barrett, Chas. L.,  
cor. Broadway & Line st., Camden, N. J.
- Bartells, George C.,  
130 East State st., Camp Point, Ill.
- Bartlett, James E.,  
50 Franklin st., Chicago, Ill.
- Bartlett, N. Gray,  
cor. 22d st. & Indiana ave., Chicago, Ill.
- Bartley, Elias H.,  
65 S. Portland ave., Brooklyn, N. Y.
- Barton, Willard M.,  
Residence unknown.
- Base, Daniel,  
329 N. Schroeder st., Baltimore, Md.
- Baskette, Frank E.,  
156 B st., San Mateo, Cal.
- BASSETT, CHARLES H.,  
109 Arch st., Boston, Mass.
- Bastian, Otto C.,  
129 W. Washington st., South Bend, Ind.
- Bate, Henry J.,  
404 E. 43d st., Chicago, Ill.
- Battles, Wilton L.,  
426 Malvern ave., Hot Springs, Ark.
- BAUER, LOUIS G.,  
261 High st, Germant'n, Philadelphia, Pa.
- Baughmann, Leo M.,  
Alexandria, S. Dak.
- Baumann, Oscar,  
102 E. 3d st., Grand Island, Neb.

- Baur, Jacob,  
76 Illinois st., Chicago, Ill.
- Bayly, Charles A.,  
1400 Devisadero st., San Francisco, Cal.
- Beal, George D.,  
Scio, O.
- Beal, James H.,  
Scio, O.
- Bear, Pierce B.,  
787 Broad st., Newark, N. J.
- Beasley, Robert S.,  
262 Central ave., Hot Springs, Ark.
- Bechberger, Henry,  
535 Kinsman st., Cleveland, O.
- Beck, Julius E.,  
Honolulu, H. I.
- Becker, Charles L.,  
304 Main st., Ottawa, Kan.
- Becker, Irwin A.,  
Care of Michael Reese Hosp., Chicago, Ill.
- Becker, Ulrich W.,  
232 Bay st., Stapleton, N. Y.
- Bedard, Geo. H.,  
1219 Pearl st., Boulder, Colo.
- Behrens, Emil C. L.,  
807 Halstead st., Chicago, Ill.
- Behrens, John F.,  
19 Cove st., Orange, N. J.
- Beilstein, Christian,  
87 Fulton st., New York, N. Y.
- Beise, John H.,  
Fergus Falls, Minn.
- Beitenman, William W.,  
2d st. & Bennett ave., Cripple Creek, Colo.
- Bell, Emil R.,  
Preston & Breckenridge sts., Louisville, Ky.
- Bell, Jno. M.,  
Fort Stanton, N. Mex.
- Bell, Robert N.,  
5140 Chester ave., Philadelphia, Pa.
- Bell, S. Howard,  
West Derry, N. H.
- Bell, Wm. Ray,  
838 Clarissa st., Pittsburg, Pa.
- Benedict, Philip V.,  
1000 Davis st., Evanston, Ill.
- Benfield, Charles W.,  
cor. Wilson & Payne aves., Cleveland, O.
- Benfield, W. Edwin,  
8527 Hough ave., N. E., Cleveland, O.
- Bent, Edward C.,  
Dell Rapids, N. Dak.
- Benton, Wilbur M.,  
303 Main st., Peoria, Ill.
- Bentz, Henry G.,  
894 Michigan st., Buffalo, N. Y.
- Berg, Albert S.,  
725 Rebecca ave., Wilkinsburg, Pa.
- Berger, Ernest,  
P. O. Box, 566, Tampa, Fla.
- Berger, Louis,  
470 Lenox ave., New York, N. Y.
- Beringer, George M.,  
501 Federal st., Camden, N. J.
- Beringer, George M., jr.,  
440 Clinton st., Camden, N. J.
- Berner, Carl A.,  
cor. 16th st. & Grand ave., Des Moines, Ia.
- Bernström, Gustaf,  
Apoteket Kronan, Göteborg, Sweden.
- Berryhill, Henry P.,  
Buttermore Block, Connellsville, Pa.
- Best, John,  
1 German Block, Central City, Colo.
- Best, Samuel M.,  
15 Rockdale st., Mattapan, Boston, Mass.
- Betha, Oscar W.,  
cor. 4th st. & 22d ave., Meridian, Miss.
- Bevens, J. I.,  
Newport, Ark.
- Bexten, Edward W.,  
102 S. 12th st., Omaha, Neb.
- Beyschlag, Charles,  
503 Main st., Lacrosse, Wis.
- Biehl, Lewis A.,  
cor. Hancock & Monroe sts., Sandusky, O.
- Bierman, Clarence H.,  
Marine Hospital, Portland, Me.
- Biermann, Wm. H.,  
468 W. Chicago ave., Chicago, Ill.
- Bieser, Chas. L.,  
1101 Sixteenth st., Denver, Colo.
- Bigelow, Clarence O.,  
106-108 Sixth ave., New York, N. Y.
- Biggs, Warren H.,  
Williamstown, N. C.
- BILLINGS, HENRY M.,  
28 W. 56th st., New York, N. Y.
- Bingham, Charles C.,  
37 Main st., St. Johnsbury, Vt.
- Biosca, Placido,  
University of Havana, Havana, Cuba.
- BIROTH, HENRY,  
965 E. 37th st., Chicago, Ill.

- Blackmore, Henry S.,  
612 F st. N. W., Washington, D. C.
- Blackwood, Russell T.,  
1261 N. 15th st., Philadelphia, Pa.
- Bladen, Jno. M.,  
Cedar City, Utah.
- Blahnik, Karel B.,  
1835 W. 47th st., Chicago, Ill.
- Blahnik, Marie (Mrs.),  
88 W. 18th st., Chicago, Ill.
- Blahnik, Vencel L.,  
1835 W. 47th st., Chicago, Ill.
- Blaikie, William,  
202 Genesee st., Utica, N. Y.
- Blair, Henry C.,  
cor. Walnut & 5th sts., Philadelphia, Pa.
- BLAKE, JAMES E.,  
96 N. 2d st., New Bedford, Mass.
- Blakeley, George C.,  
175 2d st., The Dalles, Ore.
- Blakeslee, Louis G.,  
Mallinckrodt Chem. Works, St. Louis, Mo.
- Blanding, Wm. O.,  
54 Weybosset st., Providence, R. I.
- Blank, Herman G.,  
5152 Coral st., Pittsburg, Pa.
- Bletcher, Henry E. J.,  
422 Notre Dame ave., Winnipeg, Manitoba.
- Blodau, Robert P.,  
402 Indiana ave., Indianapolis, Ind.
- Blome, Walter H.,  
426 Baldwin ave., Detroit, Mich.
- Blumenschein, Fred. J.,  
7217 Kedron ave., Pittsburg, Pa.
- Boberg, Otto, J. S.,  
206 S. Barstow st., Eau Claire, Wis.
- Bodemann, Wilhelm,  
cor. Lake ave. & 50th st., Chicago, Ill.
- Boeddiker, Otto,  
954 6th ave., New York, N. Y.
- Boehm, John J.,  
748 S. Halstead st., Chicago, Ill.
- BOEHM, SOLOMON,  
800 Morgan st., St. Louis, Mo.
- Boerner, Emil L.,  
113 Washington st., Iowa City, Ia.
- Bohlsen, Henry C.,  
1426 Garvin Place, Louisville, Ky.
- Bohmanason, Robert H.,  
Arcata, Humboldt Co., Cal.
- Bohn, George W.,  
727 Chestnut st., Evansville, Ind.
- Boldt, Fred: W.,  
2366 W. 11th st., Cleveland, O.
- Bond, J. Emory,  
2730 N. Charles st., Baltimore, Md.
- Bond, J. Newlon,  
802 Harrison st., Mt. Vernon, Ill.
- Bond, John B.,  
cor. Main & 5th sts., Little Rock, Ark.
- Bond, William C.,  
500 Main st., Little Rock, Ark.
- Bongartz, Ferdinand A.,  
353 Palisade ave., Jersey City Heights, N. J.
- Bonta, Clarence La Rue,  
York Road & 68th ave., Oak Lane, Phila., Pa.
- Booth, Albert E.,  
8 Chestnut st., Ludlow, Mass.
- Bordeaux, Henry,  
Capital Hotel Bldg., Little Rock, Ark.
- Borell, Henry A.,  
2043 Chestnut st., Philadelphia, Pa.
- BORING, EDWIN M.,  
N. E. cor. 10th & Fairmount ave., Phila., Pa.
- Bosque, Arturo,  
38 Fejadillo, Havana, Cuba.
- Boulton, Emison A.,  
1421 Eddy st., San Francisco, Cal.
- Bower, Edward A.,  
Lawrence, Mass.
- Bowman, Waldo M.,  
102 Bancroft st. E., Toledo, O.
- BOYD, GEORGE W.,  
121 Second st. N. E., Washington, D. C.
- Boyken, John W.,  
2271 Howard st., San Francisco, Cal.
- Boynton, Herschell,  
112 Main st., Biddeford, Me.
- Boyson, G. H.,  
301 1st ave., Cedar Rapids, Ia.
- Boyson, John H.,  
1000 Valencia st., San Francisco, Cal.
- Brack, Charles E.,  
cor. Ensor & Forrest sts., Baltimore, Md.
- Bradbury, Wymond H.,  
459 C st., N. W., Washington, D. C.
- Bradley, Theodore J.,  
Albany Coll. Pharm., Albany, N. Y.
- Bradshaw, Harry A.,  
39 S. 10th st., Philadelphia, Pa.
- Bradt, Warren L.,  
55-57 Washington ave., Albany, N. Y.
- Brand, Joseph H.,  
900 Richmond st., Cincinnati, O.

- Brandenberger, Adolph,  
 130 E. High st., Jefferson City, Mo.  
 Brandis, Ernest L.,  
 University Col. of Medicine, Richmond, Va.  
 Brashear, Owen L.,  
 Bristol, Tenn.  
 Brecht, Frederick A.,  
 • 209 3d st. W., Yankton, S. Dak.  
 Brenner, George F.,  
 1211 Van Buren st., Chicago, Ill.  
 Bresler, Simon L.,  
 1115 Sixteenth st., Denver, Colo.  
 Breslin, Michael T.,  
 700 Dauphine st., New Orleans, La.  
 Brewer, Howard D.,  
 19 Oxford st., Worcester, Mass.  
 Brickman, Arthur O.,  
 500 E. Baltimore st., Baltimore, Md.  
 Briggs, Andrew G.,  
 204 Howitzer Place, Richmond, Va.  
 Briggs, Armand E.,  
 301 Clement st., San Francisco, Cal.  
 Brightwell, Newton E.,  
 Pine Bluff, Ark.  
 Brinker, John H.,  
 113 W. Main st., Bellevue, O.  
 Brinton, Clement S.,  
 134 S. 3d st., Philadelphia, Pa.  
 Brisley, Harry,  
 Prescott, Ariz.  
 Bromme, William L.,  
 Mandan, N. Dak.  
 Brookes, Virginia C. (Miss),  
 Waelder, Gonzales Co., Tex.  
 Brooks, George W.,  
 1161 Myrtle ave., Brooklyn, N. Y.  
 Brown, Chas. M.,  
 Cleveland State Hospital, Cleveland, O.  
 Brown, Edward P.,  
 529 Market st., Parkersburg, W. Va.  
 Brown, George S.,  
 2901 Prytania st., New Orleans, La.  
 Brown, John C.,  
 409 N. Trajon st., Colorado Springs, Colo.  
 Brown, J. Lee,  
 Marshfield, Ore.  
 Brown, Lewis W.,  
 50 W. Palisade ave., Englewood, N. J.  
 Browning, Ernest R.,  
 220 3d st., Hot Springs, Ark.  
 Brucker, Carl,  
 82 Beekman st., New York, N. Y.  
 Bruder, Otto E.,  
 767 Sheffield ave., Chicago, Ill.  
 Brundage, Albert H.,  
 2404 State st., Milwaukee, Wis.  
 Brunn, Harold N.,  
 282 Grand ave., Chicago, Ill.  
 Bryson, William S.,  
 600 Southern ave., Pittsburg, Pa.  
 Bucknam, Frank W.,  
 Skowhegan, Me.  
 Buckner, John C.,  
 824 Ave. D., Galveston, Tex.  
 Bunnell, Lynn L.,  
 cor. Main & Maple aves., Norwood, O.  
 Buntin, William C.,  
 600 Main st., Terre Haute, Ind.  
 Bunting, George A.,  
 6 W. North ave., Baltimore, Md.  
 Burg, John D.,  
 1323 S 58th st., Philadelphia, Pa.  
 Burge, James O.,  
 303 8th ave. S., Nashville, Tenn.  
 Burghelm, Jacob,  
 1019 Congress ave., Houston, Tex.  
 Burke, Walter J.,  
 Clinton, Mass.  
 Burke, William T.,  
 1201 N. 11th st., Philadelphia, Pa.  
 Burnham, Alfred A., Jr.,  
 459 Dudley st., Boston, Mass.  
 Burnham, Ralph F.,  
 61 Broad st., Auburn, Me.  
 Burrough, Herace, Jr.,  
 509 W. Lombard st., Baltimore, Md.  
 Burton, John C.,  
 3d st., Stroud, Okla.  
 Busch, Miers,  
 1006 Spruce st., Philadelphia, Pa.  
 Butlein, Fred. L. G.,  
 124 E. Belmont st., Chicago, Ill.  
 Butsch, John L.,  
 700 N. Carey st., Baltimore, Md.  
 Butters, Chas. H.,  
 4132 Lyndale ave. S., Minneapolis, Minn.  
 Cadmus, Robert C.,  
 1941 Spring Garden st., Philadelphia, Pa.  
 Caine, S. Lee,  
 107 S. Market st., Columbus, Miss.  
 Cajulis y Samedra, Felix,  
 Residence unknown.  
 Calhoun, Will M.,  
 6735 Frankstown ave., Pittsburg, Pa.



- Calkins, Eleazer E.,  
 324 S. State st., Ann Arbor, Mich.  
 Cameron, Charles S.,  
 600 S. 15th st., Philadelphia, Pa.  
 Campbell, Albert A.,  
 235 Rondo st., St. Paul, Minn.  
 Campbell, Chas. B.,  
 200 E. st. N. W., Washington, D. C.  
 Campbell, George S.,  
 Millburn, N. J.  
 Campbell, Milton,  
 426 S. 13th st., Philadelphia, Pa.  
 Campbell, Theodore,  
 2101 N. 63d st., Overbrook, Philad'a, Pa.  
 CANDIDUS, PHILIP C.,  
 Mobile, Ala.  
 Cantor, Lorentz,  
 204 Columbia st., Brooklyn, N. Y.  
 Capdau, Pierre A.,  
 940 Elysian Fields ave., New Orleans, La.  
 Carpote, Jos ,  
 344 Principe Alfonso, Havana, Cuba.  
 CARRELL, EUGENE A.,  
 South st., Morristown, N. J.  
 Cartaya, Julio H.,  
 20 Jesus Maria st., Havana, Cuba.  
 Carter, Frank H.,  
 776 Massachusetts ave., Indianapolis, Ind.  
 Carter, Frederick L.,  
 20 Merrimac st., Boston, Mass.  
 Carter, Harlen W.,  
 1557 Roosevelt ave., Indianapolis, Ind.  
 Case, George E.,  
 621 Main st., Princeton, Ill.  
 Caspari, Charles, Jr.,  
 University of Maryland, Baltimore, Md.  
 Caspari, Chas. E.,  
 4060 Westminster Place, St. Louis, Mo.  
 Cassaday, O. U.,  
 14 W. Federal st., Youngstown, O.  
 Cassin, Elmer F.,  
 226 E. 37th st., Chicago, Ill.  
 Castillon, Louis A.,  
 900 Dumaine st., New Orleans, La.  
 Castelhun, Karl,  
 2 State st., Newburyport, Mass.  
 Cermak, Emil,  
 Omaha, Neb.  
 Chamberlin, William A.,  
 815 Haddon ave., Collingswood, N. J.  
 CHANDLER, CHARLES F.,  
 116th st. & Amsterdam ave., New York, N.Y.  
 Chantler, Vincent H.,  
 1410 35th st., Chicago, Ill.  
 Cheney, Arthur L.,  
 cor. Main & Portland sts., Morrisville, Vt.  
 Chisholm, Jesse C.,  
 Baylor Univ. Coll. of Pharm., Dallas, Tex.  
 Christensen, Henry C.,  
 529 E. Forty-third st., Chicago, Ill.  
 Claflin, Walter A.,  
 Harvard Square, Cambridge, Mass.  
 Clapham, Hesser C.,  
 2480 Emerald st., Philadelphia, Pa.  
 Clapp, Lowell T.,  
 59 Evans Road, Brookline, Mass.  
 Clark, Albert H.,  
 cor. 12th st. & Mich. ave., Chicago, Ill.  
 Clark, Alfred W.,  
 801 Jason st., Denver, Colo.  
 Clark, Arthur B.,  
 103 N. Broadway, Shawnee, Okla.  
 Clark, Malie A.,  
 117 Cotton ave., Macon, Ga.  
 Clarke, Chas. J.,  
 Main st., Paris, Ky.  
 Claus, Otto F.,  
 3513 Hebert st., St. Louis, Mo.  
 Clayton, Abraham T.,  
 Box 266, Ogontz, Pa.  
 Clayton, Chas. J.,  
 1775 Humbolt st., Denver, Col.  
 Cliffe, Wm. L.,  
 2778 Kensington ave., Philadelphia, Pa.  
 Cline, Raoul R. D.,  
 University of Texas, Galveston, Tex.  
 Clothier, C. Roland,  
 Polo, Ill.  
 Clough, Frank H.,  
 Greeley, Neb.  
 Cobb, Ralph L.,  
 112 Superior st., Cleveland, O.  
 Coblentz, Virgil,  
 115 W. 68th st., New York, N. Y.  
 Cochran, William M.,  
 Harrisville, Pa.  
 Coffman, Walter T.,  
 125 W. 4th South st., Salt Lake City, Utah.  
 Cohn, Alfred I.,  
 122 E. 74th st., New York, N. Y.  
 Colby, Chas. L.,  
 Jackson, Minn.  
 Cole, Victor L.,  
 22 E. Market st., Corning, N. Y.

- Coleman, John,  
     2500 Chapline st., Wheeling, W. Va.  
 Coleman, John H.,  
     Ironia, N. J.  
 Collier, William K.,  
     193 E. 7th st., St. Paul, Minn.  
 Collins, Albert B.,  
     50-52 Main st., Westerly, R. I.  
 Collins, Frank A.,  
     30 S. Main st., Akron, O.  
 Collins, John L.,  
     Residence unknown.  
 Collins, John S.,  
     5059 Fifth ave., Chicago, Ill.  
 Collins, Mary E. (Miss),  
     Residence unknown.  
 Colpin, Emanuel F.,  
     Smithfield, Utah.  
*Colton, James B.,*  
     766 Tremont st., Boston, Mass.  
 Comfort, Newton C.,  
     Box 424, Custom House, Manila, P. I.  
 Compton, Paul,  
     Hosp. Corps, U. S. A., Fort Crook, Nebr.  
 Congdon, George G.,  
     Phoebus, Va.  
 Conger, Frederic A.,  
     501 Selby ave., St. Paul, Minn.  
 Conger, Stephen B.,  
     349 University ave., St. Paul, Minn.  
 Connelly, Fred W.,  
     1434 Dorchester ave., Boston, Mass.  
 Conover, Samuel H.,  
     The St. James, Philadelphia, Pa.  
 Conzet, Rufus W.,  
     119 Cumberland st., Greenup, Ill.  
 Cooban, Benj. S.,  
     559 W. 63d st., Chicago, Ill.  
 Coody, A. Stimson,  
     Osyka, Miss.  
 Cook, Alfred P.,  
     342 Spring st., Portland, Me.  
 Cook, E. Fullerton,  
     145 N. 10th st., Philadelphia, Pa.  
 Cook, James O.,  
     cor. 9th & Clay sts., Hopkinsville, Ky.  
 Cook, Thomas P.,  
     114 William st., New York, N. Y.  
 Coonley, Charles,  
     Wash'ton & Michigan sts., South Bend, Ind.  
 Coons, William J.,  
     cor. Penn & Wash. sts., Indianapolis, Ind.  
 Cooper, James E.,  
     400 W. Main st., Lexington, Ky.  
 Cormick, John W.,  
     1137 Elm st., Dallas, Tex.  
 Cornell, Edward A.,  
     Pine & Fourth st., Williamsport, Pa.  
 Coté, André A.,  
     210 Fairmount st., Fitchburg, Mass.  
 Cotton, Robert M.,  
     Tyndall, S. Dak.  
 Coughlin, John,  
     177 Water st., Augusta, Me.  
 Coulson, James T.,  
     110 N. Beaton st., Corsicana, Tex.  
 Covey, John W.,  
     810 Main st., Fort Worth, Tex.  
 Covington, Samuel M.,  
     Summit, Mass.  
 Craft, Oliver A.,  
     702 Malvern ave., Hot Springs, Ark.  
 Craig, Hugh,  
     100 William st., New York, N. Y.  
 Cramer, Max,  
     1350 Tremont st., Boston, Mass.  
 Crampton, Fred. L.,  
     2301 Lexington ave., Kansas City, Mo.  
 Crane, Percy P.,  
     Elyria, O.  
 Craw, Eugene E.,  
     Sadorus, Ill.  
 Crawford, Claude M.,  
     Residence unknown.  
 Crawford, Frank E.,  
     523 Elmwood ave., Providence, R. I.  
 Crawford, Joseph,  
     2824 Frankford ave., Philadelphia, Pa.  
 Crawshaw, Herbert H.,  
     1389 Ogden ave., Chicago, Ill.  
 Creighton, Mary L. (Miss),  
     Scio, O.  
 Crook, Frank R.,  
     cor. 3d & Main sts., Ripley, O.  
 Cross, Elias H.,  
     Gadsden, Ala.  
 Crowley, Jas. P.,  
     867 Thirty-second st., Chicago, Ill.  
*Crossman, George A.,*  
     Raynham, Mass.  
 Crouch, William T.,  
     14 Bland st., Bluefields, W. Va.  
 Crowdle, John E.,  
     81 Gardner st., Newton, Mass.

- Cuervo, Adolfo,  
     83 San Lazaro, Havana, Cuba.  
 Culbreth, David M. R.,  
     1307 N. Calvert st., Baltimore, Md.  
 Culley, John,  
     2479 Washington ave., Ogden, Utah.  
 Culpepper, Thomas J.,  
     Greenville, Ga.  
 Curd, Thomas N.,  
     cor. 21st & Venable sts., Richmond, Va.  
 Curquejo, Antonio G.,  
     112 Havana st., Havana, Cuba.  
 Currier, Ralph W.,  
     40 Pond st., Beverly, Mass.  
 Curry, David W.,  
     200 Broad st., Rome, Ga.  
 Curry, Gordon L.,  
     104 Chestnut st., Louisville, Ky.  
 Cuthbert, Richard W.,  
     4000 Chestnut st., Philadelphia, Pa.  
 Cutler, Bertram C.,  
     814 Main st., Worcester, Mass.  
 Daboll, Horace H.,  
     119 State st., New London, Conn.  
 Dadd, Robert M.,  
     22 Grand ave., Milwaukee, Wis.  
 Daggett, V. Chapin,  
     17 W. 34th st., New York, N. Y.  
 Dahlin, Horace O.,  
     6731 Reynolds st., Pittsburg, Pa.  
 Danden, Raymond A. von,  
     4392 N. Clark st., Chicago, Ill.  
 Danek, John F.,  
     1228 Washington av. N., Minneapolis, Minn.  
 Daneker, Howard N.,  
     20 S. Mount st., Baltimore, Md.  
 Dare, Charles F.,  
     84 E. Commerce st., Bridgeton, N. J.  
 d'Artenay, Eugene,  
     2932 Pierce st., San Francisco, Cal.  
 Davies, Llewellyn P.,  
     Central City, Colo.  
 Davis, Charles H.,  
     30 State st., Bangor, Me.  
 Davis, Charles H.,  
     71 Waldeck st., Dorchester Center, Mass.  
 Davis, Charles L.,  
     63 State st., Newburyport, Mass.  
 Davis, Daniel F.,  
     262 N. Main st., Barre, Vt.  
 Davis, Emma M.,  
     St. Hos. Franklin & Mulberry, Scranton, Pa.  
 Davis, Eugene M.,  
     309 Lion st., Dunkirk, N. Y.  
 Davis, John A.,  
     700 N. Carey st., Baltimore, Md.  
 Dawson, Charles H.,  
     1423 Main st., Little Rock, Ark.  
 Dawson, Edward B.,  
     1034 Main st., Wheeling, W. Va.  
 Dawson, Edward S., Jr.,  
     125 S. Salina st., Syracuse, N. Y.  
 Dawson, John II.,  
     2489 Howard st., San Francisco, Cal.  
 Day, Edward J.,  
     20 Day st., Fitchburg, Mass.  
 Day, William B.,  
     Mich. Blvd. & 12th st., Chicago, Ill.  
 Dayton, Walter T.,  
     2d South & State sts., Salt Lake City, Utah.  
 DeBarr, Edwin,  
     Norman, Okla.  
*DeForest, William P.,*  
     1477 Bedford ave., Brooklyn, N. Y.  
 De Jonge, Cornelius,  
     36 Doughty st., Brooklyn, N. Y.  
 De Lorenzi, Albert,  
     Main & Ervay sts., Dallas, Tex.  
 Deakyne, Harry II.,  
     1600 Pacific ave., Atlantic City, N. J.  
 Dean, Aug. H.,  
     Emmitt & Water sts., Waverly, O.  
 Dean, H. G.,  
     214 S. Spring st., Los Angeles, Cal.  
 Dedman, Richard,  
     Arkansas City, Ark.  
 Deck, Lewis C.,  
     Girard, Macoupin Co., Ill.  
 Decker, W. Robert,  
     1607 Ridge ave., Philadelphia, Pa.  
 Deibert, Thomas I.,  
     103 N. Centre st., Pottsville, Pa.  
 Deming, William A.,  
     1525 Central ave., Hot Springs, Ark.  
 Depeyre, Louis N.,  
     432 W. Bijou st., Colorado Springs, Colo.  
 Deuel, C. Fred.,  
     18 N. Prospect st., Amherst, Mass.  
 Dewender, Wm. H.,  
     167 Atlantic ave., Brooklyn, N. Y.  
 DEWOODY, WILLIAM L.,  
     120 W. Barraque st., Pine Bluff, Ark.  
 Diamond, Peter,  
     77 Lenox ave., New York, N. Y.

- Diaz, José A.,  
412 Principe Alfonso, Havana, Cuba.
- Dickson, Fred. W.,  
1200 Madison ave., Baltimore, Md.
- Dieden, Frank X.,  
92 William st., New York, N. Y.
- DIEHL, C. LEWIS,  
932 Cherokee Road, Louisville, Ky.
- Diekman, George C.,  
115 W. 68th st., New York, N. Y.
- Diggs, Lowell C.,  
323 N. Los Angeles st., Los Angeles, Cal.
- Dillenback, Garrett V. d. V.,  
144 State st., Albany, N. Y.
- Dilly, Oscar C.,  
2101 W. Walnut st., Louisville, Ky.
- Dimmitt, Addison,  
5th ave. & Walnut st., Louisville, Ky.
- Dimond, Harry J.,  
330 Connecticut st., Buffalo, N. Y.
- Diner, Jacob,  
320 St. Nicholas ave., New York, N. Y.
- Dinkler, Frank A.,  
Hennessey, Okla.
- Dinsmore, Warren,  
Majorsville, W. Va.
- Dissosway, Thurston N.,  
460 5th st., Brooklyn, N. Y.
- Dittmeyer, Walter E.,  
Harper's Ferry, W. Va.
- Dixon, J. Marion,  
215 Newnan st., Jacksonville, Fla.
- Dodds, Richard N.,  
cor. 5th & Monroe sts., Springfield, Ill.
- Doherty, William H.,  
844 Fourth st., South Boston, Mass.
- Dohme, Alfred R. L.,  
cor. Pratt & Howard sts., Baltimore, Md.
- DOHME, CHARLES E.,  
cor. Pratt & Howard sts., Baltimore, Md.
- DOHME, LOUIS,  
cor. Pratt & Howard sts., Baltimore, Md.
- Dohme, William I.,  
Bloomfield av. & Spring st., Montclair, N. J.
- Doliber, Thomas,  
Atlantic ave. & India st., Boston, Mass.
- Donaberger, Samuel B.,  
Residence unknown.
- Donahue, Henry M.,  
2250 Market st., San Francisco, Cal.
- Donohue, Henry,  
1101 Pierce st., San Francisco, Cal.
- Dort, Edward H.,  
Auburn, Neb.
- Dougherty, Samuel E.,*  
Linden, N. J.
- Douglas, Austin E.,  
156 Green st., New Castle, Pa.
- Dow, John C.,  
Residence unknown.
- Dow, John P.,  
Lafayette, Colo.
- Dowdy, Joseph F.,  
204 Main st., Little Rock, Ark.
- Downes, Edwin R.,  
864 W. North ave., Baltimore, Md.
- Downing, Benjamin F., Jr.,  
42 Broadway, Newport, R. I.
- DRAKE, JOHN R.,  
305 E. Water st., Milwaukee, Wis.
- Drackett, Philip W.,  
409 McAlpine ave., Clifton, Cincinnati, O.
- Dresser, George E.,  
Main st., Putnam, Conn.
- Drew, Walter I.,  
203 Brackett st., Portland, Me.
- Drossel, August A.,  
282 Noe st., San Francisco, Cal.
- Drucker, August E.,  
572 Golden Gate ave., San Francisco, Cal.
- Druehl, Amanda S. (Mrs.),  
776 N. Park ave., Chicago, Ill.
- Druehl, Frank A.,  
Main st. & 2d South, Salt Lake City, Utah.
- Druehl, Louis A.,  
776 N. Park ave., Chicago, Ill.
- DRURY, LINUS D.,  
cor. Warren & Dudley sts., Boston, Mass.
- Duble, Jesse B.,  
79 Hamilton Place, New York, N. Y.
- DuBois, William L.,  
281 Main st., Catskill, N. Y.
- Duckett, Walter G.,  
22d st. & Penna. ave., Washington, D. C.
- Duering, Henry C.,  
cor. 9th & Pine sts., St. Louis, Mo.
- Dulaney, Joseph F.,  
c. o. Keefer Drug Co., Atlantic City, N. J.
- Duncan, Chester A.,  
Baylor University, Dallas, Tex.
- Duncan, Geo. H.,  
821 Kansas ave., North Topeka, Kan.
- DUNN, JOHN A.,  
36 Doughty st., Brooklyn, N. Y.

- Dunning, H. A. Brown,  
 423 N. Charles st., Baltimore, Md.  
 Dunning, Lyman T.,  
 Phillips ave. & 8th st., Sioux Falls, S. Dak.  
 Duntze, Francis C., Jr.,  
 2 W. McLean ave., Memphis, Tenn.  
 Durban, Sebastian C.,  
 708 Broad st., Augusta, Ga.  
 Dutt, William,  
 7 E. Exchange st., Akron, O.  
 Dvorak, Joseph T.,  
 2001 Fifty-first st., Chicago, Ill.  
 Dye, Clair A.,  
 Ohio State University, Columbus, O.  
 Earhart, Fred. A.,  
 1th & Chippewa sts., New Orleans, La.  
 Esterday, Herbert C.,  
 700 New Jersey ave. N.W., Washington, D.C.  
 Ebbs, John B.,  
 E. Main & Cherry sts., Waterbury, Conn.  
 EBERBACH, OTTMAR,  
 25 South Main st., Ann Arbor, Mich.  
 Eberhardt, Ernest G.,  
 116 N. Arsenal ave., Indianapolis, Ind.  
 Eberle, Arthur R.,  
 204 Main st., Watertown, Wis.  
 Eberle, Eugene G.,  
 P. O. Box 133, Dallas, Tex.  
 Eberle, Herman T.,  
 204 Main st., Watertown, Wis.  
 Eberly, Frank H.,  
 2500 Oxford st., Philadelphia, Pa.  
 Eccles, Robert G.,  
 191 Dean st., Brooklyn, N. Y.  
 Eckert, John,  
 107 Ferry st., Newark, N. J.  
 Eckford, Joseph Wm.,  
 Commerce st., Aberdeen, Miss.  
 Eckler, Charles R.,  
 344 S. Division st., Ann Arbor, Mich.  
 Eckstein, Andrew J.,  
 125 N. Minnesota st., New Ulm, Minn.  
 Eddy, Wynn L.,  
 Brigham, Utah.  
 Ehrlicher, Henry M.,  
 324 Court st., Pekin, Ill.  
 Eichold, Bernard H.,  
 c. o. Mobile Drug Co., Mobile, Ala.  
 Eichrodt, Mary E. (Mrs.),  
 1418 N. New Jersey st., Indianapolis, Ind.  
 Eisele, George,  
 635 Spruce st., Quincy, Ill.
- Eisele, Martin A.,  
 310 Central ave., Hot Springs, Ark.  
 Elam, John T.,  
 cor. 2d & Elm sts., Henderson, Ky.  
 Eldred, Frank R.,  
 1109 Central ave., Indianapolis, Ind.  
 Elfstrand, Wilhelm,  
 cor. 2d ave. & Cedar st., Two Harbors, Minn.  
 Elgin, Lewis L.,  
 4 N. Main st., Hopkinsville, Ky.  
 Eliel, Leo,  
 230 W. Washington st., South Bend, Ind.  
 Elkin, William S.,  
 cor. Peachtree & Marietta sts., Atlanta, Ga.  
 Elliott, Boyce,  
 14 Platt st., New York, N. Y.  
 Elliott, Chas. H.,  
 14th & Binney sts. N.W., Washington, D.C.  
 ELLIOTT, HENRY A.,  
 819 N. Arlington ave., Baltimore, Md.  
 Ellis, Evan T.,  
 4409 Chestnut st., Philadelphia, Pa.  
 Ellis, William H.,  
 206 Ouachita ave., Hot Springs, Ark.  
 Ely, Ernest S.,  
 North Chestnut st., Barnesville, O.  
 Emanuel, Julia E. (Miss),  
 115 W. Berry st., Ft. Wayne, Ind.  
 EMANUEL, LOUIS,  
 cor. 2d ave. & Grant st., Pittsburg, Pa.  
 Engelhard, George P.,  
 353-357 Dearborn st., Chicago, Ill.  
 Engelhardt, Hermann,  
 Liberty Road, Forest Park, Baltimore, Md.  
 England, Joseph W.,  
 415 N. 3d st., Philadelphia, Pa.  
 English, William M.,  
 318 W. 40th st., Los Angeles, Cal.  
 Engstrom, Ernst O.,  
 251 North st., Pittsfield, Mass.  
 Ennis, Ephraim L.,  
 1 West 106th st., New York, N. Y.  
 Eppstein, Jacob,  
 287 S. 5th st., Philadelphia, Pa.  
 Erck, Philip F.,  
 U. S. Armory, Springfield, Mass.  
 Erhart, William H.,  
 81 Maiden Lane, New York, N. Y.  
 Eschmann, Clemens L.,  
 1607 Sutter st., San Francisco, Cal.  
 Estabrook, Henry A.,  
 Fitchburg, Mass.

- Esters von Krakau, William,  
 2801 Bryant st., San Francisco, Cal.  
 Etzel, John L.,  
 Clear Lake, Cerro Gordo, Ia.  
 Evans, Arthur S.,  
 22 Genesee st., Utica, N. Y.  
 Evans, George B.,  
 1106 Chestnut st., Philadelphia, Pa.  
 Evans, Harry O. N.,  
 4831 Liberty ave., Pittsburg, Ia.  
 Evans, Wm. J.,  
 1 E. Madison ave., Iola, Kan.  
 Eysenbach, Henry P.,  
 1251 N. 44th ave., Chicago, Ill.  
 Fahrner, Alphonse A.,  
 200 Center st., Joliet, Ill.  
 Fairchild, Benjamin T.,  
 P. O. Box 1120, New York, N. Y.  
 Fairchild, Samuel W.,  
 cor. Washington & Laight, New York, N. Y.  
 Falk, John C.,  
 4568 Page B'lv'd, St. Louis, Mo.  
 Fanous, Amin,  
 Fayoum, Egypt.  
 Fantus, Bernard,  
 328 S. Marshfield ave., Chicago, Ill.  
 Fawcett, Charles E.,  
 2448 Fifth ave., Pittsburg, Pa.  
 Federmann, Wm. M.,  
 904 Main st., Kansas City, Mo.  
 Feick, Charles,  
 301 Hanover st., Baltimore, Md.  
 Feidt, George D.,  
 604 Arch st., Philadelphia, Pa.  
 Feil, Joseph,  
 1963 E. 71st st., Cleveland, O.  
 Fein, Mary A. (Miss),  
 1114 Thayer ave., Little Rock, Ark.  
 Feindt, Louis E.,  
 So. Orange, N. J.  
 Feldkamp, Chas. L.,  
 3269 Cottage Grove ave., Chicago, Ill.  
 Fennel, Charles T. P.,  
 cor. 8th & Vine sts., Cincinnati, O.  
 Ferger, Edward,  
 708 Capitol ave., Indianapolis, Ind.  
 Ferguson, George A.,  
 121 W. 42d st., New York, N. Y.  
 Fickardt, Fred. L.,  
 155 Main st. W., Circleville, O.  
 Fieber, Gustavus A.,  
 2400 Spring Grove ave., Cincinnati, O.  
 Figueroa, Ernesto V.,  
 49 Constitucion st., Havans, Cuba.  
 Finch, Chas. S.,  
 134 Atlantic st., Stamford, Conn.  
 Finis, Ernest A.,  
 cor. 7th & Jackson sts., Wilmington, Del.  
 Fink, Daniel J.,  
 Holdredge, Neb.  
 Finlay, Alexander K.,  
 124 Baronne st., New Orleans, La.  
 Finneran, James F.,  
 100 Tremont st., Boston, Mass.  
 Finney, John J.,  
 N. W. cor. York & Douglas sts., Phila., Pa.  
 Finninger, Paul E.,  
 461 E. 26th st., Chicago, Ill.  
 Fischer, Albert,  
 1730 Broadway, Brooklyn, N. Y.  
 Fischer, Henry,  
 1948 Gravois ave., St. Louis, Mo.  
 Fischer, Henry J.,  
 1738 W. 25th st., Cleveland, O.  
 Fischer, Richard,  
 University of Wisconsin, Madison, Wis.  
 Fischnar, John F.,  
 6859 Wentworth ave., Chicago, Ill.  
 FISH, CHAS. F.,  
 348 Broadway, Saratoga Springs, N. Y.  
 Fisher, George W.,  
 De Land, Fla.  
 Fitzpatrick, Patrick J.,  
 Wellesley, Mass.  
 Fleischner, Charles,  
 940 Grand ave., New Haven, Conn.  
 Flemer, Lewis,  
 701 Maryland av. N. E., Washington. D. C.  
 Fletcher, David M.,  
 Box 272, Vallejo, Cal.  
 Flowers, Hiland,  
 1477 Vyse ave., New York, N. Y.  
 Floyd, Henry B.,  
 1016 Massachusetts ave. N. W., Wash'n, D. C.  
 Fogas, William H.,  
 Mt. Vernon, Ind.  
 Forbes, J. Winchell,  
 230 E. 4th st., Cincinnati, O.  
 Forbrich, Joseph F.,  
 299 35th st., Chicago, Ill.  
 Ford, Charles M.,  
 cor. 11th ave. & Ogden st., Denver, Colo.  
 Forsyth, William K.,  
 3100 State st., Chicago, Ill.

- Foster, Frank H.,  
106 Marion st., Oak Park, Ill.
- Foster, John B.,  
Roseville & 7th aves., Newark, N. J.
- Foster, John W.,  
Edmond, Okla.
- Fouch, Wm. M.,  
cor. Charles st. & North ave., Baltimore, Md.
- FOUGERA, EDMUND C. H.,  
309 8th st., Brooklyn, N. Y.
- Foulke, James,  
107 Monticello av., Jersey City Heights, N. J.
- FOX, PETER P.,  
Woodland ave. & 73d st., Philadelphia, Pa.
- Fox, Willard M.,  
1492 Cedar ave., Cleveland, O.
- Frailay, Carson P.,  
West Main st., Emmitsburg, Md.
- Frailay, William O.,  
248-250 E. King st., Lancaster, Pa.
- Frames, J. Fuller,  
601 N. Gay st., Baltimore, Md.
- Francis, J. Richard,  
148-150 N. Penna. st., Indianapolis, Ind.
- Francis, John M.,  
240 Seyburn ave., Detroit, Mich.
- Franzoni, Joseph D.,  
627 Penna. ave. N. W., Washington, D. C.
- Fraser, Horatio N.,  
563 5th ave., New York, N. Y.
- Frauer, Herman E.,  
246 E. Washington st., Indianapolis, Ind.
- Freericks, Frank H.,  
802 Mercantile Library Bldg., Cincinnati, O.
- French, Harry B.,  
429 Arch st., Philadelphia, Pa.
- French, Howard B.,  
York ave. & Callowhill st., Philadelphia, Pa.
- Fricke, Frederick G.,  
Union Block, Plattsmouth, Neb.
- Fricke, Frederick H.,  
1637 N. 9th st., St. Louis, Mo.
- Friedenburg, M. W.,  
812 Main st., Winfield, Kan.
- Friesenecker, Charles M.,  
1652 W. 35th st., Chicago, Ill.
- FROHWEIN, RICHARD,  
122 1st st., Elizabeth, N. J.
- Frost, William A.,  
Selby & Western aves., St. Paul, Minn.
- Fry, Herman,  
266 E. North ave., Chicago, Ill.
- Fry, Narcys G.,  
354 E. North ave., Chicago, Ill.
- Frye, Geo. C.,  
320 Congress st., Portland, Me.
- FULLER, OLIVER F.,  
220 Randolph st., Chicago, Ill.
- Gabell, Cromwell P.,  
5202 Lancaster ave., Philadelphia, Pa.
- Gable, Ralph B.,  
90 John st., New York, N. Y.
- Gaddess, John,  
20 E. First st., Oil City, Pa.
- Gaddess, Thomas,  
20 E. First st., Oil City, Pa.
- Gaesser, Theobald T.,  
Troy, Ind.
- Gahn, Henry,  
Purveying Depot, Union Bldg., Wash., D. C.
- Gale, Edwin O.,  
85 S. Clark st., Chicago, Ill.
- Gale, William H.,  
Residence unknown.
- Gallagher, John C.,  
466 Grove st., Jersey City, N. J.
- Gallenkamp, Edward W.,  
212 Main st. Washington, Mo.
- Galvin, Mathew,  
Hosp. Corps, U. S. A., Fort Oglethorpe, Ga.
- Gamble, Stewart,  
301 Hennepin ave., Minneapolis, Minn.
- Gamer, Albert C. C.,  
P. O. Box 772, Tacoma, Wash.
- Gammon, Irving P.,  
150 Dudley st., Boston, Mass.
- Gane, Eustace H.,  
95 Fulton st., New York, N. Y.
- Gano, William H.,  
1634 Columbia ave., Philadelphia, Pa.
- Gansz, William H.,  
2129 Reading Road, Cincinnati, O.
- Gape, Arthur G.,  
Chardon, O.
- Garber, Elmer F. W.,  
31 E. Main st., Mount Joy, Lanc. co., Pa.
- GARDNER, ROBERT W.,  
50 Broad st., Bloomfield, N. J.
- Garrett, Oscar N.,  
110 N. High st., Hillsboro, O.
- Garver, Christian,  
Bloomington, Ill.
- Garvin, Patrick J.,  
Center st., Bethel, Conn.

- Gathercoal, Edmund N.,  
36 12th st., Chicago, Ill.
- Gaus, Charles H.,  
202 Washington ave., Albany, N. Y.
- Gauthier, Charles D.,  
Antigo, Wis.
- Gayle, John W.,  
cor. Ann st. & Broadway, Frankfort, Ky.
- Geisler, Joseph F.,  
6 Harrison st., New York, N. Y.
- GEORGE, CHARLES T.,  
1306 N. 3<sup>rd</sup> st., Harrisburg, Pa.
- Gerald, Herbert F.,  
Technol. Chambers, Irvington, Boston, Mass.
- Gering, Henry R.,  
Plattsmouth, Neb.
- Gertler, John H.,  
Winona Technical Inst., Indianapolis, Ind.
- Gessner, Emil A.,  
301 Chapel st., New Haven, Conn.
- Gibson, Frank L.,  
U. S. P. H. & M. H. Service, Honolulu, H. I.
- Gibson, John S.,  
Hope, Ark.
- Gibson, Robert H.,  
U. S. P. H. & M. H. Service, New Orleans, La.
- Gieley, William F.,  
Holly, Mich.
- Gietner, Charles,  
300 S. 14th st., St. Louis, Mo.
- Gilman, Elbridge W.,  
Main st., Marshfield, Vt.
- Gilpin, Henry B.,  
300-302 W. Lombard st., Baltimore, Md.
- Ginocchio, James A.,  
216 Main st., Little Rock, Ark.
- Glass, William F.,  
Lock Box 115, Hughes Springs, Tex.
- Gleason, Patrick F.,  
cor. Pine & Elm sts., Waltham, Mass.
- Gleghorn, James S.,  
2027 Morrison ave., Allegheny, Pa.
- Glogan, Alex.,  
1368 N. Clark st., Chicago, Ill.
- Glover, William H.,  
299 Essex st., Lawrence, Mass.
- Godbold, Fabius C.,  
2728 Prytania st., New Orleans, La.
- Godding, John G.,  
278 Dartmouth st., Boston, Mass.
- Goeckel, Henry J.,  
1817 Holland ave., Van Nest, Bronx, N. Y.
- Golaz, Ernest H.,  
c.o. W. S. Kirby, Main & Lamar sts., Dallas, Tex.
- Goldberg, Joseph,  
1217 N. 2d st., Philadelphia, Pa.
- Goldsborough, Charles H.,  
Culpeper, Va.
- GOOD, JAMES M.,  
2601 Olive st., St. Louis, Mo.
- Goodman, Frank S.,  
Ft. de Soto, Tampa Bay Quar. Sta., Fla.
- Goodman, John H.,  
Fitzgerald, Ga.
- Goodwin, William W.,  
Newburyport, Mass.
- Gordin, Harry M.,  
380 Chestnut st., Chicago, Ill.
- Gordin, William C.,  
cor. 10th & Main sts., Wheeling, W. Va.
- Gordon, William J. M.,  
1960 Plum st., Cincinnati, O.
- Gorgas, George A.,  
16 N. Third st., Harrisburg, Pa.
- Gorman, Mary C. (Miss),  
280 Main st., Marlboro, Mass.
- Grace, William D.,  
14 Market Square, Portsmouth, N. H.
- Graebner, Otto H.,  
1564 E. 45th st., Cleveland, O.
- Graham, Abner B.,  
104 W. 2nd st., Mishawaka, Ind.
- Graham, Charles R.,  
Main st., Brownsville, Pa.
- Graham, Karl H.,  
U. S. Marine Hospital, Baltimore, Md.
- Graham, Willard,  
332 S. 19th st., Philadelphia, Pa.
- Grassly, Charles W.,  
287 W. 12th st., Chicago, Ill.
- Gray, Margaret McC. (Mrs.),  
1388 Washington Blvd., Chicago, Ill.
- Gray, William,  
Presbyterian Hospital, Chicago, Ill.
- Grazer, Fred. A.,  
501 3rd ave., San Francisco, Cal.
- Green, Arthur L.,  
LaFayette, Ind.
- Green, Benjamin,  
12 Market Square, Portsmouth, N. H.
- Green, Carl V.,  
451 Larrabee st., Chicago, Ill.
- Green, Edward T.,  
30-32 Platt st., New York, N. Y.



- Green, Franklin T.,  
500 Devisadero st., San Francisco, Cal.
- Green, James B.,  
Main st., Plumville, Pa.
- Green, Robert L.,  
Students' Off., Univ. of N. D., Notre Dame, Ind.
- Greenawalt, S. Miller,  
19 S. Main st., Chambersburg, Pa.
- Greenawalt, William C.,  
1600 Chestnut st., Philadelphia, Pa.
- Greene, William R.,  
1 Westminister st., Providence, R. I.
- Gregorious, George,  
369 8th ave., New York, N. Y.
- Gregorious, William P.,  
cor. Bell & Park avs., Bayside, L. I., N. Y.
- Gregory, Willis G.,  
530 Main st., Buffalo, N. Y.
- Greule, Albert M.,  
cor. 4th & Overton sts., Newport, Ky.
- Grewe, Louis F.,  
1628 S. Grand ave., St. Louis, Mo.
- Greyer, Julius,  
cor. Vine & Findlay sts., Cincinnati, O.
- Griffin, Lyman W.,  
63 Warren ave., Boston, Mass.
- Griffith, Chas.,  
306 Main st., Johnstown, Pa.
- Griffith, J. Arthur,  
216 Market st., Johnstown, Pa.
- Gross, Chas. E.,  
14th & Park sts. N. W., Washington, D. C.
- Gross, William O.,  
Washington & Barr sts., Ft. Wayne, Ind.
- GROSSKLAUSS, JOHN F.,  
High st. & Public Square, Navarre, O.
- Grover, Robert O.,  
Pocahontas, Ia.
- Groves, Henry C.,  
68 W. Broadway, Ocala, Fla.
- Gruen, J. George,  
623 Fallowfield ave., Charleroi, Pa.
- Guehring, John, Jr.,  
933 Shotwell st., San Francisco, Cal.
- Guerin, James F.,  
236 Front st., Worcester, Mass.
- Guerriero, Leon M.,  
37 Nueva st., Ermita, Manila, P. I.
- Guidry, Aml.rose J.,  
133 N. Genois st., New Orleans, La.
- Gundrum, George,  
329 W. Main st., Ionia, Mich.
- Guy, Geo. O.,  
Yester Way & 2d ave., Seattle, Wash.
- Haake, William H.,  
Cedar ave. & E. 105th st., Cleveland, O.
- Hackenberger, George W.,  
112 E. 125th st., New York, N. Y.
- Haddad, Saleem F.,  
89 Broad st., New York, N. Y.
- Haeger, Fred.,  
92 State st., Chicago, Ill.
- Haeseler, Frank P.,  
247 W. Madison st., Chicago, Ill.
- Haeseler, Loren M.,  
247 W. Madison st., Chicago, Ill.
- Hagans, Daniel A.,  
2 Front st., Monroe, Mich.
- Hagec, William P.,  
101 N. Main st., St. Louis, Mo.
- Hagenow, Theodore F.,  
1500 Chouteau ave., St. Louis, Mo.
- Hahn, Charles W. J. H.,  
2300 Salisbury st., St. Louis, Mo.
- Hahn, Philip A.,  
Paris, Ark.
- Hain, Frank W. A.,  
109 Broome st., Newark, N. J.
- Haines, William F.,  
High st., Seaford, Del.
- Hall, Frank M.,  
2701 Larimer st., Denver, Col.
- Hall, Guy P.,  
1324 Swissvale st., Wilkinsburg, Pa.
- Hall, Joseph P.,  
17 Washington Sq., Suffolk, Va.
- Hall, William A.,  
177 Griswold st., Detroit, Mich.
- Hallberg, Carl S. N.,  
Michigan Bl'vd & 12th st., Chicago, Ill.
- Halladay, Thomas L.,  
80 E. 1st South st., Salt Lake City, Utah.
- Hallaway, Robert R.,  
5 Devonshire st., Carlisle, England.
- Halliburton, Orlando,  
1410 Spring st., Little Rock, Ark.
- Halstead, Alice L. (Mrs.),  
1101 E. Front st., Muscatine, Ia.
- Hamann, William A.,  
100 William st., New York, N. Y.
- Hamil, Wm. E.,  
Pocahontas, Ark.
- Hamilton, Carl,  
432 Central ave., Hot Springs, Ark.

- Hammond, William J., Jr.  
Kosciusko, Miss.
- Hammar, Alrick,  
New Ft. Lyon, Las Animas, Colo.
- Hamner, James F.,  
Camp John Hay, Benguet, P. I.
- Hance, Anthony M.,  
623 Callowhill st., Philadelphia, Pa.
- HANCE, EDWARD H.,  
Callowhill & Marshall sts., Philad'a. Pa.
- HANCOCK, CHAS. W.,  
P. O. Box 55, Langhorne, Pa.
- Hancock, James E.,  
4 S. Howard st., Baltimore, Md.
- HANCOCK, JOHN F.,  
4 S. Howard st., Baltimore, Md.
- Haney, Thomas C.,  
102 E. Schiller st., Columbus, O.
- Hankey, William T.,  
111 Water st., Cleveland, O.
- Hannan, Owen B.,  
74 Frankford st., Cleveland, O.
- Hansen, Neils P.,  
Kearney, Neb.
- Hantz, Charles N.,  
cor. 14th ave. & West st., Homestead, Pa.
- Harbaugh, Wilson L.,  
Haverford, Montgomery Co., Pa.
- Harbold, Curtis A.,  
1820 Columbia ave., Philadelphia, Pa.
- Harbold, John T.,  
Pennsylvania Hosp., Philadelphia, Pa.
- Harbord, Kittie W. (Miss),  
310 Commercial st., Salem, Ore.
- Hardin, John H.,  
226 S. Front st., Wilmington, S. C.
- Hargreaves, John,  
162 Queen st. W., Toronto, Ont., Can.
- Harkany, Samuel,  
193 Broome st., New York, N. Y.
- HARLOW, NOAH S.,  
4 Smith's Block, Bangor, Me.
- Harms, Herman,  
E & Brigham sts., Salt Lake City, Utah.
- Harper, Chas. B.,  
59 S. Howard st., Akron, O.
- Harrington, Frank,  
Main & Market sts., Logan, O.
- Harrington, Michael T., Jr.,  
Box 25, Willows, Cal.
- Harrison, Robert L.,  
3901 Williamsburg ave., Richmond, Va.
- Harrison, William H.,  
87 Lake st., Chicago, Ill.
- Harrison, William J.,  
Main st. & Clifton ave., Lakewood, N. J.
- Harson, Harry,  
39 Whitehall st., New York, N. Y.
- Harter, Isaac F.,  
Stronghurst, Ill.
- Hartigan, Joseph D.,  
1299 Main st., Bridgeport, Conn.
- Harting, Rudolph R.,  
cor. Short & Mill sts., Lexington, Ky.
- Hartwig, Otto J.,  
1570 Milwaukee ave., Chicago, Ill.
- Hartz, J. D. August,  
315 13th st., College Point, N. Y.
- Harvey, C. J.,  
80 W. 2d South st., Salt Lake City, Utah.
- Haschenburger, Edmund O.,  
1211 O st., Lincoln, Neb.
- Hassett, Thomas B.,  
105 Union st., Newton Centre, Mass.
- Hassinger, Samuel E. R.,  
Fairmount av. & 23d st., Philadelphia, Pa.
- Hatcher, Robert A.,  
414 E. 26th st., New York, N. Y.
- Hatton, Ellmore W.,  
90 N. High st., Columbus, O.
- Hauber, Peter P.,  
1680 N. Clark st., Chicago, Ill.
- Hauenstein, William,  
375 Amsterdam ave., New York, N. Y.
- Haussamen, Henry L.,  
Grafton, N. Dak.
- Haussmann, Frederick W.,  
1627 N. 8th st., Philadelphia, Pa.
- Havenhill, I. D.,  
Lawrence, Kan.
- Hawley, Ralph W.,  
Moravia, N. Y.
- Hay, Chas. L.,  
cor. Long ave. & Brady st., Du Bois, Pa.
- Hay, Edward A.,  
439 Cumberland ave., Portland, Me.
- Haydock, Susannah G. (Miss),  
2123 Locust st., Philadelphia, Pa.
- Hayes, Horace P.,  
312 Elk st., Buffalo, N. Y.
- Haymaker, Frank B.,  
316 Main st., Clarksburg, W. Va.
- HAYNES, DAVID O.,  
90 William st., New York, N. Y.

- Haynes, Herbert,  
159 Broadway, Providence, R. I.
- Hays, Francis B.,  
100 William st., New York, N. Y.
- Hebberd, Edward S.,  
331 Main st., La Crosse, Wis.
- Hechler, Edward H.,  
1099 Broadway, Cleveland, O.
- Hedquist, Alex.,  
Provo City, Utah.
- Hedquist, Francis J.,  
Provo City, Utah.
- Heebner, Charles F.,  
Ontario Coll. Pharm., Toronto, Can.
- Hegarty, Charles K.,  
501 Main st., Little Rock, Ark.
- Heidbreder, Albert H.,  
802 State st., Quincy, Ill.
- Heim, Henry,  
Janes ave. & 3rd st., Saginaw, E. S., Mich.
- Heim, William J.,  
1454 N. 10th st., Philadelphia, Pa.
- Heinemann, Albert F.,  
54 S. Washington st., Valparaiso, Ind.
- Heinemann, Lucy (Miss),  
211 E. Webster ave., Chicago, Ill.
- Heinitsh, Sigmund W.,  
16 East King st., Lancaster, Pa.
- Heinritz, Lebrecht G.,  
128 South st., Holyoke, Mass.
- Heinselman, Joseph A.,*  
Ridge & College aves, Philadelphia, Pa.
- Heiss, Ernest J.,  
764 W. Division st., Chicago, Ill.
- Helfman, Joseph,  
246 Seyburn ave., Detroit, Mich.
- Heller, Charles T.,  
33 W. 10 st., St. Paul, Minn.
- Hellmuth, Joseph A.,  
1071 N. Robey st., Chicago, Ill.
- Hellstern, Edward,  
Ouray, Colo.
- Hemm, Francis,  
Grand ave. & Arsenal st., St. Louis, Mo.
- Hengst, J. Edwin,  
Gay st. & Central ave., Baltimore, Md.
- Henkcl, Alice (Miss),  
The Ontario, Washington, D. C.
- Henkel, Charles B.,  
Md. ave. & Prince George st., Annapolis, Md.
- Henning, Adolph,  
137 Water st., New York, N. Y.
- Henry, Frank C.,  
703 15th st. N. W., Washington, D. C.
- Heppburn, John,  
103 Main st., Flushing, N. Y.
- Herbst, William P.,  
2500 Penna. ave. N. W., Washington, D. C.
- Hereth, Frank S.,  
c. o. Eli Lilly & Co., Indianapolis, Ind.
- Hermanek, Joseph C.,  
585 Centre ave., Chicago, Ill.
- Herpich, John L.,  
166 E. Main st., Columbus, O.
- Herrera, Francisco,  
85 Cuba st., Havana, Cuba.
- Herty, Frank J.,  
Hygienic Laboratory, Washington, D. C.
- Hess, Nicholas A.,  
27 S. Fulton ave., Baltimore, Md.
- Hess, Paul L.,  
Independence & Forest ave., Kansas City, Mo.
- Heusler, Philip L.,  
308-310 W. Lombard st., Baltimore, Md.
- HEYDENREICH, EMILE,  
30 N. William st., New York, N. Y.
- Heyl, James B.,*  
Vice-Consul, Hamilton, Bermuda.
- Hickerson, William H.,  
Warren, Huntingdon Co., Ind.
- High, Raymond L.,  
1314 Colwyn st., Philadelphia, Pa.
- Highfield, Herbert M.,  
227 N. 7th st., Zanesville, O.
- Hill, Aubrey T.,  
303 W. Pratt st., Baltimore, Md.
- Hill, Warren B.,  
426 Caswell Block, Milwaukee Wis.
- Hilpert, Willis S.,  
2440 Indiana ave., Chicago, Ill.
- Hilton, Samuel L.,  
1033 22d st. N. W., Washington, D. C.
- Hindle, William P.,  
987 Main st., Bridgeport, Conn.
- Hinton, Rufus G.,  
The Parkside, 40th & Girard ave., Phila., Pa.
- Hires, Lewis Moore,  
12 6th ave., Roebling, N. J.
- Hirseman, Felix,  
807 Courtland ave., New York, N. Y.
- Hiss, A. Emil,  
3000 Wentworth ave., Chicago, Ill.
- Hitchcock, George H.,  
1031 6th ave., New York, N. Y.

- Hitchcock, John E.,  
     Custom House Sq., Plattsburgh, N. Y.  
 Hoch, Aquila,  
     543 F. Thompson st., Philadelphia, Pa.  
 Hoch, Quintus,  
     2429 Frankford ave., Philadelphia, Pa.  
 Hodgson, Joseph A.,  
     196 Whalley ave., New Haven, Conn.  
 Hodson, Daniel F.,  
     1025 N. Clark st., Chicago, Ill.  
 Hodson, Eugene W.,  
     101 E. Baltimore st., Baltimore, Md.  
 Hoechstetter, Max S.,  
     31 McClure ave., N. S., Pittsburg, Pa.  
 Hoffmann, George F.,  
     Pesotum, Ill.  
 Hoffmann, George L.,  
     321 Fourth st., Logansport, Ind.  
 Hoffmann, Geo. W.,  
     321 Fourth st., Logansport, Ind.  
 Hogaboom, George A.,  
     703 Pleasant st., Hot Springs, Ark.  
 Holliday, Francis E.,  
     81 Fulton st., New York, N. Y.  
 Holloway, Jesse D.,  
     113 Sixth st., East Liverpool, O.  
 Holm, Marinus L.,  
     c.o. State Board of Health, Lansing, Mich.  
 HOLMES, CLAY W.,  
     410 W. Gray st., Elmira, N. Y.  
 Holmes, Henry E.,  
     209 Third ave. S., Seattle, Wash.  
 Holsopple, J. Bert,  
     cor. Ridge and Noble aves., Crafton, Pa.  
 Holt, Edwin M.,  
     New Orleans Quarantine Sta., La.  
 Holt, Lewis H., Jr.,  
     601 Third-ave. N., Nashville, Tenn.  
 HOIZHAUER, CHARLES,  
     787 Broad st., Newark, N. J.  
 Holzhauser, Charles W.,  
     787 Broad st., Newark, N. J.  
 HOOD, CHARLES I.,  
     Merrimac & Central sts., Lowell, Mass.  
 Hood, William D.,  
     Le Noir Drug Co., Kinston, N. C.  
 Hook, James P.,  
     Main st., Hancock, Md.  
 Hoover, George W.,  
     Bureau of Chemistry, Washington, D. C.  
 Hope, Robert L.,  
     Centralia, Mo.  
 Hopkins, Jesse L.,  
     Woodbridge Eldg., New York, N. Y.  
 Hepp, Lewis C.,  
     1104 Euclid ave., Cleveland, O.  
 Horlick, Alex. J.,  
     Horlick Food Co., Racine, Wis.  
 Horn, Wilbur F.,  
     32 W. Main st., Carlisle, Pa.  
 Horne, Warren W.,  
     23 Hay st., Fayetteville, N. C.  
 Horton, Charles H.,  
     154 Northampton st., Boston, Mass.  
 Houghton, F. Mark,  
     130 Lergfeilcw ave., Detroit, Mich.  
 Hover, William A.,  
     1437 Lawrence st., Denver, Colo.  
 Howard, Fletcher (Mrs.),  
     1455 E. Grand ave., Des Moines, Ia.  
 Howard, Henry,  
     Brookeville, Md.  
 Howard, Sam A.,  
     411 Garrison ave., Ft. Smith, Ark.  
 Howell, Edward V.,  
     University Drug Co., Chapel Hill, N. C.  
 Howell, Percy C.,  
     Army Medical Museum, Washington, D. C.  
 Howson, Arthur B.,  
     cor. Paint & Main sts., Chillicothe, O.  
 Hubbard, Fred. A.,  
     425 Center st., Newton, Mass.  
 Huber, Jos. A.,  
     Louisville, Colo.  
 Huder, Henry J.,  
     52 E. Washington st., Indianapolis, Ind.  
 Huclnut, Richard A.,  
     44 E. 19th st., New York, N. Y.  
 Hudson, Arthur,  
     Centre st., Newton, Mass.  
 Husted, Alfred B.,  
     77 Eagle st., Albany, N. Y.  
 Hughes, Francis S.,  
     cor. 15th & Oxford sts., Philadelphia, Pa.  
 Huhn, Charles H.,  
     98 Western ave., Minneapolis, Minn.  
 Hull, Ralph W.,  
     1299 Sheridan Road, Chicago, Ill.  
 Hummel, John A.,  
     New Madrid, New Madrid Co., Mo.  
 Humphreys, Charles J.,  
     602 Prospect ave., Hot Springs, Ark.  
 Hunsberger, Ambrose,  
     416 S. 15th st., Philadelphia, Pa.

- Hunt, Byrd H.,  
502 Prospect ave., Hot Springs, Ark.
- Hunt, Reid,  
Hyg. Lab., P. H. & M. H. S., Washington, D. C.
- Hunter, Angus,  
c. o. El Paso Drug Co., El Paso, Tex.
- Huntley, Clyde G.,  
Oregon City, Ore.
- Hurd, John C.,  
26 Market st., Somersworth, N. H.
- Hurlebaus, George W.,  
2030 14th st. N. W., Washington, D. C.
- Hurley, Horace O.,  
2326 3rd st., Louisville, Ky.
- Hurty, John N.,  
104 N. Penn st., Indianapolis, Ind.
- Huston, Thos. B.,  
1833 Adams st., Toledo, O.
- Huston, Thos. W.,  
Summit & Madison aves., Toledo, O.
- Hyde, Byron M.,  
202 Main st. E., Rochester, N. Y.
- Hynson, Henry P.,  
423 N. Charles st., Baltimore Md.
- Ilhardt, William K.,  
4836 Delmar Boulevard, St. Louis, Mo.
- Itlis, George W.,  
U. S. M. Hospital, Detroit, Mich.
- Ink, Charles E.,  
Columbiana, O.
- Irvine, Darwin W.,  
8th South & W. Temple sts., Salt Lake City, Utah
- Irvine, Ephraim D.,  
357 Dearborn st., Chicago, Ill.
- Isakovica, Alois von,  
Monticello, N. Y.
- Ittner, William F.,  
2301 S. Grand ave., St. Louis, Mo.
- Jackman, Wilbur F.,  
Orono, Me.
- Jackson, Chas. A.,  
cor. Delaware & Pacific aves. Atlantic City, N. J.
- Jackson, Frank A.,  
90 Main st., Woonsocket, R. I.
- Jackson, Samuel R.,  
344 Central ave., Hot Springs, Ark.
- Jacobs, Charles C.,  
U. S. P. H. & M. H. S., Havana, Cuba.
- JACQUES, GEORGE W.,  
Broadway & Augusta st., S. Amboy, N. J.
- Jamieson, George A.,  
816 North ave., Bridgeport, Conn.
- JAMIESON, THOMAS N.,  
4508 Woodlawn ave., Chicago, Ill.
- Janssen, Jacob S.,  
Milwaukee & Wisconsin sts., Milwaukee, Wis.
- Jeffrey, Frank D.,  
503 Park ave., Hot Springs, Ark.
- Jehlik, Anton J.,  
534 W. 26th st., Chicago, Ill.
- Jelinek, John P.,  
295 W. 7th st., St. Paul, Minn.
- Jennings, Algernon C.,  
108 Ouachita st., Hot Springs, Ark.
- Jensen, Gerhard H.,  
Northwestern Univ. Bldg., Chicago, Ill.
- Jesson, Jacob,  
Euclid ave., Ontario, Cal.
- Joergensen, Sophus,  
Commercial st., La Crosse, Skagit Co., Wash.
- Johnson, Charles W.,  
5031 15th ave. N. E., Seattle, Wash.
- Johnson, Joy H.,  
80 W. 2nd South st., Salt Lake City, Utah.
- Johnson, Manuel,  
50 Obispo st., Havana, Cuba.
- Johnson, Marcy Marion,  
Vandalia, Mo.
- Johnson, Ralph H.,  
Monongahela & Duquesne aves, Swissvale, Pa.
- Johnson, Thur W.,  
1239 Michigan ave., Chicago, Ill.
- Johnston, George P.,  
Lexington, Okla.
- Johnstone, J. C.,  
1818 S. Chicago ave., Chicago, Ill.
- Jones, David F.,  
106 Granite Block, Watertown, S. Dak.
- Jones, James T.,  
855 E. 4th st., South Boston, Mass.
- Jones, Oscar W.,  
27 Court st., Auburn, Me.
- JONES, SIMON N.,  
cor. 1st & Jefferson sts., Louisville, Ky.
- Jones, Thomas W.,  
1726 W. 22d st., Los Angeles, Cal.
- Jones, William D.,  
107 E. Bay st., Jacksonville, Fla.
- de Jongh, Pedro,  
80 Independencia, Cadenas, Cuba.
- Jorden, Henry A.,  
56 E. Commerce st., Bridgeton, N. J.
- Jorgenson, Edward B.,  
1263 5th ave., San Francisco, Cal.

- Josenhans, Reinhardt C. J.,  
 242 W. North ave., Chicago, Ill.  
 Judd, Albert F.,  
 Pittsburg Coll. Pharm., Pittsburg, Pa.  
 Judge, Charles R.,  
 515 Olive st., St. Louis, Mo.  
 Judson, Arthur F.,  
 562 Main st., Winsted, Conn.  
 Jungk, Walter A.,  
 1125 W. 59th st., Chicago, Ill.  
 Jungmann, Julius,  
 1020 3d ave., New York, N. Y.  
 Justice, J. Edwin,  
 237 Foster st., Nashville, Tenn.  
 Kaemmerer, Wm. F.,  
 410 S. 6th st., Columbus, O.  
 Kahn, Julius H.,  
 448 N. Clark st., Chicago, Ill.  
 Kahn, Solomon K.,  
 cor. 11th st. & Washington ave., Phila., Pa.  
 Kaiser, Herman W.,  
 Central ave., Fort Lee, N. J.  
 Kalish, Oscar G.,  
 cor. 23d st. & 4th ave., New York, N. Y.  
 Kalkman, Henry A.,  
 475 Thames st., Newport, R. I.  
 Kalusowski, Henry E.,  
 808 I st. N. W., Washington, D. C.  
 Kantrowitz, Hugo,  
 105 W. 94th st., New York, N. Y.  
 Karg, George,  
 161 E. North ave., Chicago, Ill.  
 Kasper, Albert F.,  
 2601 Princeton ave., Chicago, Ill.  
 Kassulke, August,  
 459 E. Washington st., Indianapolis, Ind.  
 Katz, Gustave,  
 2139 St. Charles ave., New Orleans, La.  
 Katz, Otto,  
 cor. Vine & Liberty sts., Cincinnati, O.  
 Kauffman, Emmett C.,  
 Hosp. Corps, U. S. A., Fort Hancock, N. J.  
 Kauffman, George B.,  
 235 N. High st., Columbus, O.  
 Keaney, James J.,  
 cor. Charles & West sts., Malden, Mass.  
 Kearfott, C. P.,  
 Martinsville, Va.  
 Kebler, Lyman F.,  
 Bureau of Chemistry, Washington, D. C.  
 Keemer, Edgar B.,  
 231 W. 12th st., Indianapolis, Ind.  
 Keenan, Thomas J.,  
 66 W. Broadway, New York, N. Y.  
 Keith, Irwin A.,  
 4 Lake st., Lake Preston, S. D.  
 Keller, Chas. F., Jr.,  
 1606 D st., Eureka, Cal.  
 Keller, William O. E.,  
 Arcata, Cal.  
 Kelley, John J.,  
 2500 N. 31st st., Philadelphia, Pa.  
 Kelley, Reuben B.,  
 469 E. Fair st., Atlanta, Ga.  
 Kelly, E. Frank,  
 2846 N. Calvert st., Baltimore, Md.  
 Kelly, Thomas,  
 241 S. Exeter st., Baltimore, Md.  
 Kemp, Edward,  
 135 Water st., New York, N. Y.  
 Kempf, Fred. F.,  
 83 Fox st., Aurora, Ill.  
 Kendall, Wallace W.,  
 Superior, Neb.  
 KENNEDY, EZRA J.,  
 90 William st., New York, N. Y.  
 Kent, Henry A.,  
 E. Broad st. & Jefferson ave., Elizabeth, N. J.  
 Kephart, Philip,  
 Berrien Springs, Mich.  
 Kercher, Edwin H.,  
 4128 Market st., Philadelphia, Pa.  
 Kester, Joseph A.,  
 Onaga, Kan.  
 Ketchem, James S.,  
 cor. Front & Main sts., Imboden, Ark.  
 Kettler, Edward, Jr.,  
 Farwell ave. & Brady st., Milwaukee, Wis.  
 Kiedaisch, George A.,  
 422 Main st., Keokuk, Ia.  
 Kiler, Abdel W.,  
 1441 N. High st., Columbus, O.  
 KILMER, FREDERICK B.,  
 147 College ave., New Brunswick, N. J.  
 Kimberly, Chas. H.,  
 1715 Cherry st., Philadelphia, Pa.  
 King, George A. N.,  
 c.o. Twin City Drug Mills, Minneapolis, Minn.  
 King, Jacob M. C.,  
 534 Malvern ave., Hot Springs, Ark.  
 KING, JAMES T.,  
 Main & South sts., Middletown, N. Y.  
 Kingman, Ignatius,  
 East Grand Forks, Minn.

- Kirchgasser, William C.,  
74 Laight st., New York, N. Y.
- Kirchgessner, William C.,  
7 S. Division st., Grand Rapids, Mich.
- Kirk, Frank H.,  
1400 Spruce st., Philadelphia, Pa.
- Kirk, James E.,  
1301 Main st., Jacksonville, Fla.
- Kirk, Samuel B.,  
1400 Spruce st., Philadelphia, Pa.
- Kirkland, Derwentwater,  
320 S. Spring st., Los Angeles, Cal.
- Kisker, Frederick W.,  
S. E. cor. 7th & Mound sts., Cincinnati, O.
- Klein, Edward N. E.,  
cor. 14th st. & 5th ave., College Point, N. Y.
- Klein, Ernest F.,  
Great Northern Hotel, Hot Springs, Ark.
- Kleine, Oscar C., Jr.,  
110 Hamburg ave., Brooklyn, N. Y.
- Klenze, William T.,  
1301 E. Belmont ave., Chicago, Ill.
- Klie, G. H. Charles,  
5100 N. Broadway, St. Louis, Mo.
- Kliemad, George,  
H'p. Co's, Ft. Worden, Port Townsend, Wash.
- Kline, Clarence M.,  
266 W. Tulpehocken, Germantown, Phila., Pa.
- Kline, Mahlon N.,  
427 Arch st., Philadelphia, Pa.
- Klore, William W.,  
2354 State st., Chicago, Ill.
- KLUSSMANN, HERMANN,  
110 First st., Hoboken, N. J.
- Knabe, Gustavus A.,  
Court Sq. & Dexter ave., Montgomery, Ala.
- Kniseley, Herman D.,  
Checotah, Okla.
- Knoche, Wm. P.,  
6053 S. Halstead st., Chicago, Ill.
- Knoebel, Percy T.,  
209 Collinsville ave., East St. Louis, Ill.
- Knoebel, Thomas,  
209 Collinsville ave., East St. Louis, Ill.
- Knoefel, Bruno,  
1419 E. Spring st., New Albany, Ind.
- Knoefel, Charles D.,  
110 E. Market st., New Albany, Ind.
- Knowlton, George H.,  
744 Elm st., Manchester, N. H.
- Knox, James W. T.,  
54 Edison ave., Detroit, Mich.
- Knox, Steven D.,  
1124 W. Markham st., Little Rock, Ark.
- Koch, August F.,  
Amana, Ia.
- Koch, Christopher,  
Germ'n av., Diamond & 6th sts., Phila., Pa.
- Koch, Fred C.,  
1519 Garfield Blvd, Chicago, Ill.
- Koch, Julius A.,  
Bluff & Pride sts., Pittsburg, Pa.
- Koch, William J.,  
211 St. Ann's ave., New York, N. Y.
- Koegel, Herman H.,  
c.o. DuBois, Kolb & Co., Paducah, Ky.
- Koelle, Otto C.,  
518 Wall st., Sioux City, Ia.
- Kolsch, Julius,  
202 Harrison ave., Leadville, Colo.
- Kornmann, Henry,  
831 Harlem ave., Baltimore, Md.
- Koss, Frank,  
548 Broad st., Fremont, Neb.
- Kossler, Herman S.,  
Residence unknown.
- Kradwell, Gustav V.,  
201 Sixth ave., Racine, Wis.
- KRAEMER, HENRY,  
424 S. 44th st., Philadelphia, Pa.
- Kramer, Wilhelm,  
1665 Lincoln ave., Chicago, Ill.
- Krassnosky, Samuel,  
65 Miller st., Pittsburg, Pa.
- Kraus, Otto,  
2801 Poplar st., Philadelphia, Pa.
- Krause, John,  
160 Beach st., Cleveland, O.
- Kreizinger, Karl L.,  
1250 N. Irving st., Fremont, Neb.
- Krecji, Leo C.,  
2534 E. 37th st., Cleveland, O.
- Krembs, Ernest M.,  
420 11th ave., Milwaukee, Wis.
- KREMERS, EDWARD,  
University of Wisconsin, Madison, Wis.
- Kress, Horace,  
Springfield, S. Dak.
- Krieger, John C.,  
136 Main st., Salamanca, N. Y.
- Krizan, William,  
5501 Halstead st., Chicago, Ill.
- Kroavica, Antony,  
313 E. 22nd st., Chicago, Ill.

- Kronberger, Israel B.,  
San Rafael, Cal.
- Krul, John G.,  
2801 W. Chestnut st., Louisville, Ky.
- Kuder, William F.,  
342 Jennings ave., Cleveland, O.
- Kuehne, Charles,  
571 Central ave., Jersey City Heights, N. J.
- Kurtz, Irving W.,  
c. o. Parke, Davis & Co., St. Louis, Mo.
- Kutchbauch, John F.,  
1707 Blue Rock st., Cincinnati, O.
- Kutscher, George W.,  
812 Braddock ave., Braddock, Pa.
- LaGrange, John V.,  
U. S. P. H. & M. II. Service, Savannah, Ga.
- LaPierre, Elie H.,  
96 River st., Cambridgeport, Mass.
- LaWall, Charles H.,  
39 S. 10th st., Philadelphia, Pa.
- LaWall, Millicent R. (Mrs.),  
39 S. 10th st., Philadelphia, Pa.
- Lacey, William H.,  
1900 Green st., Philadelphia, Pa.
- Lachance, Seraphin,  
1538 St. Katherine st., Montreal, Can.
- Lackenbach, Frederick I.,  
Box 84, Los Gatos, Cal.
- Lackey, Richard H.,  
500 W. Lehigh ave., Philadelphia, Pa.
- Ladakis, Triantaphyllo,  
Syrian Protestant College, Beirut, Syria.
- Ladish, Erich H.,  
632 Larrabee st., Chicago, Ill.
- Lamar, William R.,  
5656 Clemens ave., St. Louis, Mo.
- Lambert, Richard J.,  
528 W. Monroe st., Chicago, Ill.
- Lamm, Edward L.,  
307 S. Front st., Mankato, Minn.
- Lampa, Robert R.,  
120 William st., New York, N. Y.
- LAND, ROBERT H.,  
812 Broad st., Augusta, Ga.
- Land, Robert H., Jr.,  
1134 Broad st., Augusta, Ga.
- Landon, Ray I.,  
Lawler, Ia.
- Langenhan, H. Aug.,  
36 E. 12th st., Chicago, Ill.
- Larrabee, Charles W.,  
311 Broadway, Revere, Mass.
- Larsen, Lars P.,  
1498 W. Madison st., Chicago, Ill.
- Larson, Martin,  
Callender, Ia.
- Lascoff, J. Leon,  
Lexington ave & 83rd st., New York, N. Y.
- Latham, Thomas,  
cor. 3rd ave. & 75th st., New York, N. Y.
- Latou, William L.,  
229 Kirkpatrick st., Braddock, Pa.
- Laue, John M. A.,  
175 3d st., Portland, Ore.
- Lautz, Wm. H.,  
1601 Lehigh ave., Philadelphia, Pa.
- Lawrence, George W.,  
Residence unknown.
- Lawrence, Henry H.,  
1308 Arch st., Philadelphia, Pa.
- Le Richeux, Alfred C.,  
405 E. 4th st., Duluth, Minn.
- Leavitt, Adoniram J.,  
194 Maine st., Brunswick, Me.
- Leber, Jacob G.,  
114 Pine st., York, Pa.
- Lee, Richard H.,  
9th st. & Brooklyn ave., Kansas City, Mo.
- Lee, William E.,  
2327 Brown st., Philadelphia, Pa.
- Leeb, Theodore F.,  
501 W. Fifth st., Winona, Minn.
- Leedom, Charles,  
1403 Filbert st., Philadelphia, Pa.
- Leet, Robt. A.,  
Box 492, Oakland, Cal.
- Leftwich, Harry P.,  
1022 Central ave., Indianapolis, Ind.
- Legel, John G.,  
Charles City, Ia.
- Legendre, Joseph A.,  
124 Baronne st., New Orleans, La.
- Lehman, C. Walter,  
310 Central ave., Hot Springs, Ark.
- Lehman, Louis,  
1229 N. Halstead st., Chicago, Ill.
- Lehr, Philip,  
1145 Lorain st., Cleveland, O.
- LEIS, GEORGE,  
747 Massachusetts st., Lawrence, Kan.
- Leitch, James C.,  
212 W. 4th st., Los Angeles, Cal.
- Lemasters, William O.,  
624 S. Main st., Akron, O.



- LEMBERGER, JOSEPH L.,**  
 5 N. Ninth st., Lebanon, Pa.  
**Lembke, Carl H. F.,**  
 601 Nebraska ave., Toledo, O.  
**Lemly, Charles C.,**  
 364 Central ave., Hot Springs, Ark.  
**Letzler, Axel E.,**  
 201 W. Erie st., Chicago, Ill.  
**Leverly, John A.,**  
 1655 Main st., Bridgeport, Conn.  
**Levinson, Joseph,**  
 11 Main st., Napa, Cal.  
**Levy, William M.,**  
 1383 Magazine st., New Orleans, La.  
**Lewis, Ernest G.,**  
 701 Centre st., Jamaica Plain, Mass.  
**Lewis, Henry,**  
 509 State st., Madison, Wis.  
**Lichthardt, George H. P.,**  
 1800 M st., Sacramento, Cal.  
**Light, Isam M.,**  
 143 E. 35th st., Chicago, Ill.  
**Lillich, Bert A.,**  
 615 St. Paul st., Baltimore, Md.  
**Lillie, Forest B.,**  
 204 Harrison ave., Guthrie, Okla.  
**Lilly, Eli,**  
 1500 N. Meridian st., Indianapolis, Ind.  
**Lilly, Josiah K.,**  
 Indianapolis, Ind.  
**Lindley, Ira W.,**  
 Central City, Neb.  
**Lindly, John M.,**  
 Winfield, Henry Co., Ia.  
**Lindvall, Gus.,**  
 cor. 15th st. & 5th ave., Moline, Ill.  
**Lippy, George H.,**  
 Residence unknown.  
**Llewellyn, Frederick W.,**  
 West Side Square, Mexico, Mo.  
**LEWELLYN, JOHN F.,**  
 Public Square, Mexico, Audrian Co., Mo.  
**LLOYD, JOHN URI,**  
 cor. Court & Plum sts., Cincinnati, O.  
**Lloyd, Strauss L.,**  
 Inverness, Fla.  
**Loehr, Theodore C.,**  
 Carlinsville, Macoupin Co., Ill.  
**Loertz, Carl E.,**  
 c. o. F. Stearns & Co., Detroit, Mich.  
**Loesser, Paul A.,**  
 2679 Manree st., Toledo, O.  
**Lohmann, Herman J.,**  
 90 Monticello ave., Jersey City, N. J.  
**Lohmann, John,**  
 Main st., Edwardsdale, Pa.  
**Long, John N. G.,**  
 cor. Diamond & 20th sts., Philadelphia, Pa.  
**Lordier, Charles J.,**  
 117 W. Winchester ave., Ashland, Ky.  
**Lorenz, John S.,**  
 1425 Grace st., Chicago, Ill.  
**Lough, Thomas W.,**  
 3617 Sunset Place, Seattle, Wash.  
**Lovis, Henry C.,**  
 2137 7th ave., New York, N. Y.  
**Lowe, Charles H.,**  
 861 Amsterdam ave., New York, N. Y.  
**Lowe, Clement B.,**  
 6630 Germantown ave., Philadelphia, Pa.  
**Lowell, Edward M.,**  
 12 High st., Lewiston, Me.  
**Lowry, George W.,**  
 Colton, S. Dak.  
**Lowry, Wm. J., Jr.,**  
 509 W. Lombard st., Baltimore, Md.  
**Ludwig, Wm. E.,**  
 1344 Dorr st., Toledo, O.  
**Lueder, Fritz,**  
 509 S. Adams st., Peoria, Ill.  
**Luve, Frank A. A.,**  
 Hosp. Corps, U. S. A., Fort Sheridan, Ill.  
**Lyford, Earl H.,**  
 cor. Main & Mechanic sts., Berlin, N. H.  
**Lyman, Rufus A.,**  
 1641 S. 21st st., Lincoln, Neb.  
**Lynn, Charles J.,**  
 c. o. Eh Lilly & Co., Indianapolis, Ind.  
**LYONS, ALBERT B.,**  
 72 Brainerd st., Detroit, Mich.  
**Lyons, Lucien E.**  
 Camp & Gravier sts., New Orleans, La.  
**Maddowell, Wm. F.,**  
 U. S. P. H. & M. H. S., Ellis Island, N. Y.  
**Machenheimer, Don G.,**  
 Public Drug Co., Shawnee, Okla.  
**Mackey, James C.,**  
 50 Holzman st., Paterson, N. J.  
**Macy, Sherman R.,**  
 Highland Park Normal Coll., Des Moines, Ia.  
**Maggio, James L.,**  
 507 Spring st., West Hoboken, N. J.  
**Magruder, Chas. G.,**  
 4138 Magazine Hill, New Orleans, La.

- Maguire, Edward S.,  
U. S. P. H. & M. H. Service, Mobile, Ala.
- MAIN, THOMAS, F.,  
44 Hudson st., New York, N. Y.
- Maisch, Henry,  
711 Edmondson ave., Baltimore, Md.
- Maisel, Joseph,  
136 Third ave., Brooklyn, N. Y.
- Major, John R.,  
800 7th st., Washington, D. C.
- Mallard, Albert E.,  
32 Adams ave. W., Detroit, Mich.
- MALLINCKRODT, EDWARD,  
Mallinckrodt & Main sts., St. Louis, Mo.
- Mann, Charles F.,  
900 Woodward ave., Detroit, Mich.
- Mansfield, Samuel,  
1001 W. Baltimore st., Baltimore, Md.
- Mansfield, William,  
115 W. 68th st., New York, N. Y.
- Mares, Ferdinand I.,  
cor. 49th & Grover sts., Omaha, Neb.
- Mares, Frank M.,  
2876 Archer ave., Chicago, Ill.
- Mariamson, Max,  
165th st. & Caldwell ave., New York, N. Y.
- Marion, Etienne J.,  
St. Charles & Napoleon avs., New Orleans, La.
- Marr, William G.,  
2030 N. Halstead st., Chicago, Ill.
- Marsden, Josh E.,  
2229 Spruce st., Philadelphia, Pa.
- Marsh, Geo. H.,  
Calera, Ala.
- Martin, Frank W.,  
Residence unknown.
- Martin, Harry,  
421 S. Broad st., Philadelphia, Pa.
- Martin, James H.,  
49 S. Main st., Winchester, Ky.
- Martin, John F.,  
9157 Commercial ave., Chicago, Ill.
- Martin, Nicholas H.,  
Ravensw'd L. Fell, Gateshead-on-Tyne, Eng.
- Martin, William R.,  
222 Main st., Norfolk, Va.
- Martinez, Alfred,  
cor. Consulado & Animas sts., Havana, Cuba.
- Mason, Ernest L.,  
368 Montrose ave., Chicago, Ill.
- Mason, Harry B.,  
P. O. Box 484, Detroit, Mich.
- Mason, Myron R.,  
San Fran. Quar. Sta., Angel Island, Cal.
- Mata y Acosta, Joaquin,  
402 San Lazaro, Havana, Cuba.
- Mathison, Soren,  
2126 Indiana ave., Chicago, Ill.
- Matousek, Joseph T.,  
2361 E. 82d st., Cleveland, O.
- MATSON, GEORGE H., JR.,  
662 E. Long st., Columbus, O.
- Matthews, Charles E.,  
221 Randolph st., Chicago, Ill.
- Matusow, Harry,  
S. W. cor. 3rd st. & Columbia av., Phila., Pa.
- Maxwell, Charles C.,  
Arlington, S. Dak.
- May, Charles C.,  
Vandeventer st. & W. Belle Place, St. Louis, Mo.
- May, Louis,  
7802 Third ave., Brooklyn, N. Y.
- Mayer, Joseph L.,  
Room 314, 200 Broadway, New York, N. Y.
- Mayer, Peter,  
19 W. Main st., Marshalltown, Ia.
- Mayo, Caswell A.,  
66 W. Broadway, New York, N. Y.
- McAdams, William J.,  
503 Brushton ave., Pittsburg, Pa.
- McArthur, Jas. W.,  
2305 Broadway, Spokane, Wash.
- McArthur, Robert M.,  
Winston-Salem, N. C.
- McBride, Chas. R.,  
U. S. M. Hosp., Memphis, Tenn.
- McCartney, Frank L.,  
c.o. Sharp & Dohme, 41 Johnst., New York, N. Y.
- McCartney, Frank S.,  
3713 Locust st., Philadelphia, Pa.
- McCaughan, John H.,  
545 First ave. So., Seattle, Wash.
- McCauley, Charles E.,  
106 Marion st., Oak Park, Ill.
- McClerkin, Felix W.,  
700 Main st., Little Rock, Ark.
- McClugage, John J.,  
511 E. 63rd st., Chicago, Ill.
- McClure, Clarence M.,  
632 Congress st. E., Detroit, Mich.
- McClure, Ulysses G.,  
1256 S. Lawndale ave., Chicago, Ill.
- McCombie, James N.,  
93 Armory st., Boston, Mass.

- McConaughy, Thomas S.,  
202 S. Main st., Washington, Pa.
- McConnell, Chas. H.,  
84 State st., Chicago, Ill.
- McConnell, Lewis W.,  
McCook, Neb.
- McConomy, Paul L.,  
20th & Callowhill sts., Philadelphia, Pa.
- McCoy, James E.,  
272 W. 119th st., New York, N. Y.
- McCracken, Oscar V.,  
1406 14th st., Oakland, Cal.
- McCrea, Harry F.,  
625 Sixteenth st., Denver, Colo.
- McDaniel, J. Preuit,  
Thorndale, Tex.
- McDonald, Harry S.,  
New Albany, Ind.
- McDonald, Walter D.,  
5425 Superior st., Cleveland, O.
- McElhenie, Thomas D.,  
259 Ryerson st., Brooklyn, N. Y.
- McFerren, J. D.,  
239 N. 53rd st., Philadelphia, Pa.
- McGee, George,  
Detroit, Tex.
- McGill, John T.,  
Vanderbilt University, Nashville, Tenn.
- McGinniss, E. K.,  
Sulphur, Okla.
- McGovern, John F.,  
Jefferson, Green Co., Pa.
- McINTYRE, EWEN,  
303 N. 74th st., New York, N. Y.
- McINTYRE, EWEN, JR.,  
992 Sixth ave., New York, N. Y.
- McINTYRE, WILLIAM,  
2434 N. 32nd st., Philadelphia, Pa.
- McKay, Felix E.,  
Duval st., Troupe, Tex.
- McKenna, Harry A.,  
559 S. Broadway, Los Angeles, Cal.
- McKenzie, Robt. H.,  
1701 Lawrence st., Denver, Colo.
- McKesson, Donald,  
91 Fulton st., New York, N. Y.
- McKesson, G. Clinton,  
91 Fulton st., New York, N. Y.
- McKesson, JOHN R.,  
91 Fulton st., New York, N. Y.
- McKinney, Robert S.,  
Taneytown, Md.
- McKown, Joseph O.,  
cor. 1st & J sts., Livermore, Cal.
- McLarty, Colin,  
U. S. Hosp., Yokohama, Japan.
- McMahon, Joseph,  
248 Clermont ave., Brooklyn, N. Y.
- McMahon, Stonewall J.,  
Batesville, Ark.
- McNeil, Robert,  
cor. Front & York sts., Philadelphia, Pa.
- McNess, Frederick,  
cor. Spring & Liberty sts., Freeport, Ill.
- McPherson, George,  
43 Bryant ave., Chicago, Ill.
- McQuillen, Francis,  
7301 Vincennes Road, Chicago, Ill.
- McVay, Ernest Avery,  
552 W. 79th st., Chicago, Ill.
- Meadows, Asbury W.,  
761 Park ave., Hot Springs, Ark.
- Meeker, George II.,  
140 E. 3rd st., Media, Pa.
- Mehl, Henry W.,  
cor. 5th & Delaware sts., Leavenworth, Kan.
- Meissner, Frederick W., Jr.,  
820 Main st., La Porte, Ind.
- Meixner, Fred. M. F.,  
9 E. Polk st., Chicago, Ill.
- Nellor, Alfred,  
2130 Mt. Vernon st., Philadelphia, Pa.
- Menk, Charles W.,  
106 Market st., Newark, N. J.
- Mentzer, Harvey H.,  
245 W. Chelton ave., Germ'nt'n, Phila., Pa.
- Mercer, Wm. E.,  
Liberty, Ill.
- Meredith, H. Lionel,  
319 Washington st., Hagerstown, Md.
- Merrell, Charles G.,  
cor. 5th & Butler sts., Cincinnati, O.
- Merrell, George,  
cor. 5th & Butler sts., Cincinnati, O.
- Merrell, George R.,  
cor. 4th & Market sts., St. Louis, Mo.
- Merrell, Hubert S.,  
cor. 4th & Market sts., St. Louis, Mo.
- Merts, Edward L.,  
2128 Calhoun st., Fort Wayne, Ind.
- Meserve, Albert W.,  
10 Main st., Kennebunk, Me.
- Metz, Abraham L.,  
Prytania st., New Orleans, La.

- Metzger, Arthur S.,  
1915 Washington ave., Cairo, Ill.
- Metzger, Matthias C.,  
1915 Washington ave., Cairo, Ill.
- Meyer, Adolph C.,  
118 W. Lombard st., Baltimore, Md.
- Meyer, Charles L.,  
1531 Madison ave., Baltimore, Md.
- Meyer, Frederick H.,  
1072 Lincoln ave., Chicago, Ill.
- Meyer, Martin M.,  
118 N. Main st., South Bend, Ind.
- Meyer, Theodore F.,  
cor. 4th st. & Clark ave., St. Louis, Mo.
- Meyer, Walter F.,  
452 Colorado ave., Colorado City, Colo.
- Michaelis, Gustavus,  
1 Myrtle ave., Albany, N. Y.
- Mierzwa, Richard,  
4724 Liberty ave., Pittsburg, Pa.
- Mikkelsen, Niels,  
Kenosaw, Neb.
- Millard, David R.,  
cor. Baltimore & South sts., Baltimore, Md.
- Millener, William S.,  
cor. 4th & Pine sts., Williamsport, Pa.
- MILLER, ADOLPH W.,  
3rd & Callowhill sts., Philadelphia, Pa.
- Miller, Albert,  
157 Lincoln ave., Chicago, Ill.
- Miller, Charles,  
401 Fillmore st., San Francisco, Cal.
- Miller, Chas. E.,  
Post Office Building, St. Louis, Mo.
- Miller, Emerson R.,  
Auburn, Ala.
- Miller, Frederick J.,  
3916 Cedar ave., Cleveland, O.
- Miller, F. William,  
Lock Box 221, Homestead, Ia.
- Miller, Roshier W.,  
718 North ave., Barton Heights, Va.
- Miller, T. Ashby,  
519 E. Broad st., Richmond, Va.
- Milligan, John D.,  
276 Harvard st., Cambridgeport, Mass.
- Mills, Geo. P.,  
1000 Davis st., Evanston, Ill.
- Minchart, John R.,  
Temple College, Philadelphia, Pa.
- Miner, Maurice A.,  
87 Lake st., Chicago, Ill.
- Minesinger, Norman W.,  
915 Braddock av., Braddock, Pa.
- Minton, Charles N.,  
Jefferson ave., Washington, Pa.
- Mitermiller, John A.,  
Miles ave., opp. Leonard, Cleveland, O.
- Mittelbach, William,  
114 Main st., Boonville, Mo.
- Mix, Willis L.,  
871 Chapel st., New Haven, Conn.
- Moerk, Frank X.,  
13th st., & Chelton ave., Oak Lane, Phila., Pa.
- Mohler, David C.,  
Box 16, Ada, O.
- Molwitz, Ernest,  
2707 8th ave., New York, N. Y.
- Momaghan, Thomas F.,  
Olney ave., Germant'n, Philadelphia, Pa.
- MOORE, JOACHIM B.,  
13th & Lombard sts., Philadelphia, Pa.
- Moore, John T.,  
932 Rhode Island st., Lawrence, Kan.
- Moore, Silas H.,  
525 4th st., Sioux City, Ia.
- Moore, Thomas H.,  
45 Lafayette st., New York, N. Y.
- Morales, C. Garcia,  
412 Principe Alfonso, Havana, Cuba.
- Morgan, Aylmer L.,  
Washington & Adams sts., Camden, Ark.
- Morgan, Charles,  
1300 N. Caroline st., Baltimore, Md.
- Morgan, Frank E.,  
1629 Walnut st., Philadelphia, Pa.
- Morgan, Thomas, Jr.,  
Vandalia, Mo.
- Morgan, Thomas L.,  
Pine Grove, W. Va.
- Morin, Ludger J.,  
Main st., Danielson, Conn.
- Morris, George A.,  
U. S. M. Hospital, St. Louis, Mo.
- MORRIS, LEMUEL I.,  
Broad & Oxford sts., Philadelphia, Pa.
- Morris, Max,  
cor. Cherry st. & Cotton ave., Macon, Ga.
- Morris, Richard G.,  
802 Central ave., Hot Springs, Ark.
- Morrison, Joseph E.,  
P. O. Box 683, Montreal, Can.
- Morrison, George S.,  
22 East Pike st., Canonsburg, Pa.

- Morse, Edward W.,  
     Townly Park, Mt. Vernon, Ill.  
 Morse, Frank D.,  
     50 Deering st., Portland, Me.  
 Morse, H. B.,  
     Ardmore, Pa.  
 Mosher, William W.,  
     13 Colony st., Meriden, Conn.  
 Motter, Murray G.,  
     1841 Summit ave., Washington, D. C.  
 Moulder, Bettie L. (Miss),  
     Linn Creek, Mo.  
 Moxley, Roland R.,  
     Hillsboro, N. H.  
 Moya, Carlos A.,  
     41 Galiano st., Havana, Cuba.  
 Moyer, Lewis N.,  
     23 E. Main st., Lititz, Pa.  
 Moyer, Ray P.,  
     300 Grant st., Pittsburg, Pa.  
 Mrazek, Leo L.,  
     614 W. 18th st., Chicago, Ill.  
 Muchnic, Adolph M.,  
     1600 Forbes st., Pittsburg, Pa.  
 Mueller, Ambrose,  
     Bristol Bldg., Webster Groves, Mo.  
 Mueller, J. George,  
     101 S. Meridian st., Indianapolis, Ind.  
 Mueller, Otto E.,  
     1832 Baxter ave., Louisville, Ky.  
 Muench, Wm.,  
     608 N. Salina st., Syracuse, N. Y.  
 Muhlhan, Otto E.,  
     1111 St. Clair st., Cleveland, O.  
 Muir, John D.,  
     73 Monroe st., Grand Rapids, Mich.  
 Muir, William,  
     1366 Broadway, Brooklyn, N. Y.  
 Mulford, Henry K.,  
     412 S. 13th st., Philadelphia, Pa.  
 Munson, James G.,  
     12 S. First st., San José, Cal.  
 Murray, Alexander,  
     San José de Costa Rica.  
 Murray, Benjamin L.,  
     care of Merck & Co., New York, N. Y.  
 Musselman, Claude J.,  
     Paris, Tex.  
 Muth, George G.,  
     23-25 S. Charles st., Baltimore, Md.  
 Muth, John C.,  
     23-25 S. Charles st., Baltimore, Md.
- Muth, John S.,  
     23-25 S. Charles st., Baltimore, Md.  
 Myers, Carvosso O.,  
     513 Mound st., Atchison, Kan.  
 Myers, Charles J.,  
     30 Tannehill st., Pittsburg, Pa.  
 Myers, Preston B.,  
     1523 Farnam st., Omaha, Neb.  
 Myerson, Isaac A.,  
     495 Sutter ave., Brooklyn, N. Y.  
 Mygdal, Thorkil,  
     549 N. California ave., Chicago, Ill.  
 Napp, William G.,  
     5000 Prytania st., New Orleans, La.  
 Neal, Charles C.,  
     301 W. Pratt st., Baltimore, Md.  
 Neal, Charles W.,  
     2200 Union st., San Francisco, Cal.  
 Neal, Thomas L.,  
     Medford, Okla.  
 Nebig, William G.,  
     2143 N. 18th st., Philadelphia, Pa.  
 Needham, Robert H.,  
     1319 Gould ave. N., Ft. Worth, Tex.  
 Neeley, Guy M.,  
     254 11th st. S. E., Washington, D. C.  
 Nelden, Ralph,  
     66 S. 13th st., Salt Lake City, Utah.  
 Nelligar, Frederick D.,  
     cor. Church & Charlotte sts., Norfolk, Va.  
 Nelson, Burt E.,  
     Binghamton State Hosp., Binghamton, N. Y.  
 Nelson, Edwin H.,  
     Brooklyn & Lafayette aves., Detroit, Mich.  
 Neu, D. Alfred,  
     423 Summit ave., West Hoboken, N. J.  
 Newcomb, Edwin L.,  
     427 Elmer st., Vineland, N. J.  
 Newlon, Howard M.,  
     352 S. Spring st., Los Angeles, Cal.  
 NEWMAN, GEORGE A.,  
     cor. 5th & Walnut sts., Louisville, Ky.  
 Newton, Clarke H. W.,  
     63 Bank st., Waterbury, Conn.  
 Newton, Robert A.,  
     Southborough, Mass.  
 Nichols, Thomas B.,  
     170 Essex st., Salem, Mass.  
 Nie, Henry J.,  
     736 Prospect ave., Kansas City, Mo.  
 Niece, Frederick E.,  
     1328 Teller ave., New York, N. Y.

- Nielson, John,  
Ortonville, Minn.
- Niethammer, Otto F.,  
100 N. State st., Chicago, Ill.
- Nitardy, Ferdinand W.,  
1105 Broadway, Denver, Colo.
- Nixon, Charles F.,  
Leominster, Mass.
- Noll, Martin J.,  
925 Goodfellow ave., St. Louis, Mo.
- Noll, Mathias,  
627 Commercial st., Atchinson, Kan.
- Norton, George E.,  
223 Putnam ave., Cambridgeport, Mass.
- Nutt, Sidney M.,  
344 Central ave., Hot Springs, Ark.
- O'Gorman, Theophilus V.,  
U.S. Immigrant Hosp., Ellis Is'd, N. Y. Harbor.
- O'Hare, James,  
6 Benefit st., Providence, R. I.
- O'Neil, Henry M.,  
888 Columbus ave., New York, N. Y.
- Oettinger, Albert,  
967 N. 5th st., Philadelphia, Pa.
- Ogier, William R.,  
1365 Bryden Road, Columbus, O.
- Oglesby, George D.,  
5603 Grove ave., Chicago, Ill.
- OHLIGER, LEWIS P.,  
75 Medbury ave., Detroit, Mich.
- Ohliger, Willard,  
75 Medbury ave., Detroit, Mich.
- Oldberg, Oscar,  
Northwestern Univ. Bldg., Chicago, Ill.
- OLESON, OLAF M.,  
Fort Dodge, Ia.
- Oliver, Frank M.,  
416 S. 13th st., Philadelphia, Pa.
- Oliver, William M.,  
132 Broad st., Elizabeth, N. J.
- Oliveros, Sidney A.,  
Tryon, N. C.
- Orear, Edwin G.,  
Maryville, Mo.
- Orme, James H.,  
Marion, Ky.
- Ortenstein, Harry M.,  
4701 Cottage Grove ave., Chicago, Ill.
- Orton, Ingomar F.,  
2113 Market st., Galveston, Tex.
- Osborne, Melmoth M.,  
Elkins Park, Pa.
- Osseward, Cornelius,  
708 2d ave., Seattle, Wash.
- Osterlund, Otto W.,  
46th st., & Baltimore ave., Philadelphia, Pa.
- Ott, Clarence R.,  
Fort Stanton, N. Mex.
- Ottinger, James J.,  
20th & Spruce sts., Philadelphia, Pa.
- Otto, Theodore G. E.,  
402 Washington st., Columbus, Ind.
- Overbeck, Bernard H., Jr.,  
1928 Freeman ave., Cincinnati, O.
- Overstreet, Wm. P.,  
1624 15th st., Louisville, Ky.
- Overton, Burr M.,  
2010 First st., Louisville, Ky.
- Owen, Frank D.,  
200 S. Broadway, Los Angeles, Cal.
- OWENS, RICHARD J.,  
Myrtle ave. & Spencer st., Brooklyn, N. Y.
- Pachali, Theodore, Jr.,  
1501 Locust st., Philadelphia, Pa.
- Packard, C. Herbert,  
7 Central Square, (East) Boston, Mass.
- Paddock, Morris V.,  
Union st., St. John, N. B., Can.
- Padron, Thomas,  
14 Belascoain, Havana, Cuba.
- Paine, E. Fernandez,  
928 White st., Key West, Fla.
- Paris, James E.,  
Cave-in-Rock, Ill.
- Parisen, George W.,  
Smith & High sts., Perth Amboy, N. J.
- Parker, Frederick M.,  
528 Capitol Blvd., St. Paul, Minn.
- Parkison, Will S.,  
Glenwood Springs, Colo.
- Partridge, Frank R.,  
Water st., Augusta, Me.
- PATCH, EDGAR L.,  
P. O. Box 639, Stoneham, Mass.
- Patch, James A.,  
Syrian Protestant College, Bierût, Syria.
- Patterson, Charles M.,  
7410 Monticello st., Pittsburg, Pa.
- Patterson, Charles W.,  
87 Lake st., Chicago, Ill.
- Patterson, G. Orvill,  
Hawesville, Ky.
- Patterson, Theodore H.,  
3640 Cottage Grove, ave., Chicago, Ill.

- Patton, John F.,  
     273 W. Market st., York, Pa.  
 Pauley, Frank C.,  
     939 Ailanthus ave., St. Louis, Mo.  
 Payne, George F.,  
     50 Armstrong st., Atlanta, Ga.  
 Peacock, Bertha L. (Mrs.),  
     Erie & Broad sts., Germantown, Phila., Pa.  
 Peacock, Josiah C.,  
     Erie & Broad sts., Germantown, Phila., Pa.  
 Pearce, Howard A.,  
     370 Elmwood ave., Providence, R. I.  
 Peairs, Howard A.,  
     165 E. 36th Place, Los Angeles, Cal.  
 Pearre, Albert L.,  
     4 S. Market st., Frederick, Md.  
 Pearson, Joseph F.,  
     U. S. Naval Station, Newport, R. I.  
 Pearson, Paul,  
     18th & Florida ave. N.W., Washington, D.C.  
 Pearson, Wm. A.,  
     Hahnemann Med. Coll., Philadelphia, Pa.  
 Pease, Autumn V.,  
     408 Fourth st., Fairbury, Neb.  
 Pedigo, Smith C.,  
     Saint Jo, Tex.  
 Pedroso, Manuel,  
     71 Reina st., Havana, Cuba.  
 Pegg, Harry W.,  
     236 Dinwiddie st., Pittsburg, Pa.  
 Pelz, Charles T.,  
     1007 W. Franklin st., Evansville, Ind.  
 Perdue, William L.,  
     Auburn, Ala.  
 Perkins, Benjamin A.,  
     94 Commercial st., Portland, Me.  
 Perry, Clifford H.,  
     Chief Surgeon's Office, Zamboanga, P. I.  
 Perry, Frank V.,  
     4054 Morgan st., St. Louis, Mo.  
 Perry, Frederick W. R.,  
     747 Woodward ave., Detroit, Mich.  
 Peter, Minor C.,  
     832 Sixth st., Louisville, Ky.  
 Peters, Henry A.,  
     Oconomowoc, Wis.  
 Peters, Otto R.,  
     55 West 6th st., Salt Lake City, Utah.  
 Petersheim, John F.,  
     224 Water st., Evansville, Ind.  
 Petsche, Bismark Wm.,  
     Arlington Chemical Co., Yonkers, N.Y.
- Pettersen, Ernest W.,  
     25 S. Palafox st., Pensacola, Fla.  
 PETTIT, HENRY M.,  
     15 S. Main st., Carrollton, Mo.  
 Pfaff, Edward F.,  
     275 Lenox ave., New York, N. Y.  
 Pfaff, Henry, Jr.,  
     3121 Lowe ave., Chicago, Ill.  
 Pfaffin, Henry A.,  
     Patton ave. & Church st., Asheville, N. C.  
 Pfluger, Henry C.,  
     P. O. Box 307, Honolulu, H. I.  
 Philips, Waldemar B.,  
     Box 272, Fruitvale, Cal.  
 Phillips, Carrie E. (Miss),  
     81 Concord ave., Cambridge, Mass.  
 Phillips, William R.,  
     2458 Wentworth ave., Chicago, Ill.  
 Pieck, Edward L.,  
     cor. 6th & Main sts., Covington, Ky.  
 Pierce, Fred,  
     c. o. Ballagh & Co., Nevada, Mo.  
 Pierce, Olive B. (Miss),  
     240 Dearborn st., Chicago, Ill.  
 Pierce, William H.,  
     316 Shawmut ave., Boston, Mass.  
 Piercy, Joseph C.,  
     P. O. Box 943, Tonopah, Nev.  
 Pietkiewitz, Wladyslav,  
     364 Main st., Pittsburg, Pa.  
 Pile, Gustavus,  
     1011 S. 11th st., Philadelphia, Pa.  
 Pinaud, Pierce R.,  
     Geddes, S. Dak.  
 Pirie, Alfred M.,  
     Calle Real, Cartago, Costa Rica, A. C.  
 PITT, JOHN R.,  
     218 Main st., Middletown, Conn.  
 Pitts, William B.,  
     291 Atlantic ave., Boston, Mass.  
 Placak, Harry,  
     c. o. Benton, Hall & Co., Cleveland, O.  
 Plaut, Albert,  
     120 William st., New York, N. Y.  
 Plough, William H.,  
     603 Smithfield st., Pittsburg, Pa.  
 Poehner, Adolf A.,  
     1517b. Golden Gate ave., San Francisco, Cal.  
 Poley, Warren H.,  
     33 E. Upsal st., Mt. Airy, Philadelphia, Pa.  
 Pollard, August T.,  
     239 S. 11th st., Philadelphia, Pa.

- Porr, W. F.,  
 1734 Amsterdam ave., New York, N. Y.  
 Porter, George M.,  
 2842 Armour ave., Chicago, Ill.  
 PORTER, HENRY C.,  
 cor. Main & Pine sts., Towanda, Pa.  
 Porter, Martin L.,  
 Danforth, Me.  
 Porter, William H.,  
 330 Market st., Logansport, Ind.  
 Posey, Henry G.,  
 1020 Milan st., New Orleans, La.  
 Potter, Herschel E.,  
 Paragould, Ark.  
 Potter, Maynard H.,  
 Piggott, Ark.  
 Potts, David G.,  
 224 Market st., Philadelphia, Pa.  
 Potts, Thomas H.,  
 79 Dearborn st., Chicago, Ill.  
 Powell, William C.,  
 Snow Hill, Md.  
 POWER, FREDERICK B.,  
 6 King st., Snow Hill, London, Eng.  
 Pozzi, Frank C.,  
 67 N. 3rd st., Portland, Ore.  
 Prall, Delbert E.,  
 201 Genesee ave., Saginaw, Mich.  
 Pratt, Thomas M.,  
 1381 E. 9th st., Cleveland, O.  
 Price, Charles H.,  
 226 Essex st., Salem, Mass.  
 Price, Joseph,  
 226 Essex st., Salem, Mass.  
 Prior, Toney,  
 234 San José ave., San Francisco, Cal.  
 Pritchard, Benjamin E.,  
 1211 Bessemer Bldg., Pittsburg, Pa.  
 Puckner, William A.,  
 103 Dearborn ave., Chicago, Ill.  
 Puhl, Richard H.,  
 2339 Central ave., Minneapolis, Minn.  
 Puig, Juan E.,  
 67 Consulado st., Havana, Cuba.  
 Pulse, John J.,  
 Grangeville, Idaho.  
 Quackinbush, Benjamin F.,  
 703 Greenwich st., New York, N. Y.  
 Queeny, John F.,  
 1810 S. Second st., St. Louis, Mo.  
 Quigley, Richard L.,  
 2036 G. st. N. W., Washington, D. C.  
 Quin, Frank W.,  
 815 St. Charles st., New Orleans, La.  
 Quirk, Edmund C., Jr.,  
 c. o. J. N. Thibodeaux, New Iberia, La.  
 Rabak, Frank,  
 Bureau Plant Industry, Washington, D. C.  
 Raeuber, Edward G.,  
 49 Biddle st., Milwaukee, Wis.  
 Rafter, Michael,  
 343 Fourth ave., New York, N. Y.  
 Ramsaur, David W.,  
 201 Lemon st., Palatka, Fla.  
 Ramsdell, Clifford,  
 17 W. 34th st., New York, N. Y.  
 Ramsey, George,  
 200 Broadway, New York, N. Y.  
 RAMSPERGER, GUSTAVUS,  
 424 Central Park West, New York, N. Y.  
 Rand, Daniel M.,  
 172 Cumberland ave., Portland, Me.  
 Randall, Frank O.,  
 107 N. Main st., Brockton, Mass.  
 Rano, Charles O.,  
 45 W. Mohawk st., Buffalo, N. Y.  
 Rapelye, Charles A.,  
 853 Main st., Hartford, Conn.  
 Rapport, George L.,  
 4 Maple ave., Hartford, Conn.  
 Raubenheimer, Otto,  
 1341 Fulton st., Brooklyn, N. Y.  
 Rauff, U. Gilbert,  
 cor. 6th & Thompson sts., Philadelphia, Pa.  
 Rauschenberg, Sidney,  
 29 S. 12th ave., Mt. Vernon, N. Y.  
 Rauschkolb, John,  
 246 E. Fulton st., Columbus, O.  
 Raysor, C. A.,  
 31 Patton ave., Asheville, N. C.  
 Redsecker, Jacob H.,  
 810 Cumberland st., Lebanon, Pa.  
 Reed, Willoughby H.,  
 Marshall & Astor sts., Norristown, Pa.  
 Reese, David J.,  
 1645 Huntingdon st., Philadelphia, Pa.  
 Reh fuss, Chas.,  
 1301 Columbia ave., Philadelphia, Pa.  
 Reid, William W.,  
 Sanford, N. C.  
 Reilly, Robert C.,  
 3300 Meramec st., St. Louis, Mo.  
 Reimann, George,  
 405 Genesee st., Buffalo, N. Y.



- Remington, J. Percy,  
514 Arch st., Philadelphia, Pa.
- REMINGTON, JOSEPH P.,  
1832 Pine st., Philadelphia, Pa.
- Renfroe, Harris B.,  
care of Gus C. Kendall, Meridian, Miss.
- Reuter, Walter H.,  
Union, Ore.
- Reyer, Emil,  
614 Portage ave., South Bend, Ind.
- Rhode, Rudolph E.,  
504 N. Clark st., Chicago, Ill.
- Rice, Ivan S.,  
519 N. Garfield ave., Pocatello, Ida.
- Rich, W. Pitt,  
Grove ave., Verona, Essex Co., N. J.
- Richard, Valleix B.,  
Jennings, La.
- Richardson, Frank,  
Cambridge, N. Y.
- Richardson, Horatio S.,  
Main st., Concord, Mass.
- Richardson, Samuel W.,  
708 Walden ave., Buffalo, N. Y.
- Richardson, Willard S.,  
316 4½ st. S. W., Washington, D. C.
- Richtmann, William O.,  
Satsuma Heights, Fla.
- Riddell, Benjamin F.,  
8 Granite Block, Fall River, Mass.
- Ridgway, Lemuel A.,  
Boone, Ia.
- Ridgway, William F.,  
1101 Atlantic ave., Atlantic City, N. J.
- Riegel, Samuel J.,  
3327 N. 21st st., Philadelphia, Pa.
- Riemenschneider, Julius H.,  
95 Evanston ave., Chicago, Ill.
- Riess, Herman W.,  
Hosp. Corps, U. S. A., Fort Sheridan, Ill.
- Riley, Cassius M.,  
30th st. & Lawton ave., St. Louis, Mo.
- Ringer, Charles E.,  
5100 Liberty ave., Pittsburg, Pa.
- Rippetoe, John R.,  
570 E. 133rd st., New York, N. Y.
- Ritter, Clyde,  
Angola, Ind.
- Roach, Jeremiah T.,  
2838 Girard ave., Philadelphia, Pa.
- Roadcap, Silas M.,  
Bedford City, Va.
- Robertson, Felix O.,  
P. O. Box 33, Portland, Ore.
- Robertson, William F.,  
Gonzales, Tex.
- Robinson, Henry S.,  
Colliers, W. Va.
- ROBINSON, JAMES S.,  
cor. 2d & Madison sts., Memphis, Tenn.
- Robinson, William J. M.,  
12 Mt. Morris Park W., New York, N. Y.
- Rockefeller, Howard,  
24 West Park st., Butte, Mont.
- Rodemoyer, William E.,  
4900 Second ave., Pittsburg, Pa.
- Roe, J. Newton,  
College ave. & Locust st., Valparaiso, Ind.
- Roe, John T.,  
Government & Royal sts., Mobile, Ala.
- Roehr, Clarissa M. (Miss),  
University Hospital, San Francisco, Cal.
- Roehrig, Albert M.,  
U.S.M., Hosp., Stapleton, Staten Island, N.Y.
- Roeller, Edward F.,  
Velasco, Tex.
- Roemer, Frederick,  
634 Baldwin st., Waterbury, Conn.
- Roenne, Paul L.,  
700 Ninth ave., New York, N. Y.
- Rogers, Arthur H.,  
Geneseo, Livingston Co., N. Y.
- Rogers, Ora L.,  
Kalona, Ia.
- Rogers, Edward,  
U. S. M. Hosp., Port Townsend, Wash.
- ROGERS, WILLIAM H.,  
North st., Middletown, N. Y.
- Rohr, Arthur von,  
78 E. 3d st., Winona, Minn.
- Roll, Tod B.,  
Residence unknown.
- Rommel, Hans C.,  
2139 N. Clarke st., Chicago, Ill.
- Rosenberg, Samuel S.,  
2565 E. 38th st., Cleveland, O.
- Rosengarten, George D.,  
1700 Fitzwater st., Philadelphia, Pa.
- Rosenthal, David A.,  
cor. Gay & Clinch sts., Knoxville, Tenn.
- Rosenthal, Joseph,  
3300 Cottage Grove ave., Chicago, Ill.
- Ross, Otto E.,  
c. o. Goldthorp Drug Co., Conde, S. Dak.

- Rosenzweig, Benj.,  
The Lakewood, 495 8th ave., Brooklyn, N. Y.
- Roth, Charles R.,  
333 E. Tuscarawas st., Canton, O.
- Rothwell, Walter,  
Hatboro, Pa.
- Rounds, Marvin B. C.,  
734 W. 120th st., Chicago, Ill.
- Roush, Frederick A.,  
Box 4, Pomeroy, O.
- Rowles, James O.,  
344 Central ave., Hot Springs, Ark.
- Rowlinski, Robert A.,  
104 Broughton st., Savannah, Ga.
- Rozanski, Boleslaus J.,  
1426 Addison st., Chicago, Ill.
- Koziene, Robert P. M.,  
120 E. Washington st., Phoenix, Ariz.
- Rudder, William H.,  
3 Lyon Block, Salem, Ind.
- Ruddiman, Edsel A.,  
Vanderbilt University, Nashville, Tenn.
- Ruenzel, Henry G.,  
753 3rd st., Milwaukee, Wis.
- Ruesch, Wm. E.,  
805 Oneida st., Joliet, Ill.
- Ruhl, Harry F.,  
Manheim, Lancaster Co., Pa.
- RUMSEY, SAMUEL L.,  
cor. Fort & Hotel sts., Honolulu, H. I.
- Runkel, Julia (Miss),  
754 Larrabee st., Chicago, Ill.
- RUNYON, EDWARD W.,  
11 W. 42d st., New York, N. Y.
- Ruppe, Bernard C.,  
203 W. Central ave., Albuquerque, N. M.
- Rusby, Henry H.,  
115 W. 68th st., New York, N. Y.
- Russell, Hamilton,  
703 Franklin st., Tampa, Fla.
- Rust, Schuyler S.,  
George & Paterson sts., New Brunswick, N. J.
- Rutz, Walter,  
Port Townsend, Wash.
- Ryan, Ambrose E.,  
El Paso, Tex.
- Ryan, Frank G.,  
c. o. Parke Davis & Co., Detroit, Mich.
- Ryder, Horace F.,  
2940 Washington st., Roxbury, Mass.
- Ryder, Louis W.,  
P. H. & M. H. Service, Washington, D. C.
- Saalbach, Carl,  
1436 Fifth ave., Pittsburg, Pa.
- Saalbach, Louis,  
1436 5th ave., Pittsburg, Pa.
- Saccar, Michael,  
Lay's Drug Store, Hallettsville, Tex.
- Sacks, Bernard,  
1931 2d ave., New York, N. Y.
- Sadtler, Samuel P.,  
N. E. cor. 10th & Chestnut sts., Phila., Pa.
- Sahn, Louis N.,  
22 Cliff st., New York, N. Y.
- Sala, Albert F.,  
205 W. 12th st., Winchester, Ind.
- Salchert, Herman A.,  
985 N. Halstead st., Chicago, Ill.
- Sample, Oliver H.,  
Verner st. & California ave., Allegheny, Pa.
- Samson, Max,  
117 Camp st., New Orleans, La.
- SANDER, ENNO,  
2801-2811 Lawton ave., St. Louis, Mo.
- Sanford, John F.,  
York Village, Me.
- Sandkoetter, H. P.,  
3140 Wabash ave., Chicago, Ill.
- Sarradet, Atal A.,  
c. o. Parker-Blake Co., Donaldsonville, La.
- Sarra, Ernesto,  
41 Tenientekey st., Havana, Cuba.
- Sass, Stephen K.,  
749 W. 18th st., Chicago, Ill.
- Sauerbrun, Otto O.,  
366 S. 4th st., Columbus, O.
- SAUNDERS, WILLIAM,  
Central Experiment Farm, Ottawa, Can.
- Sauvinet, Chas. D.,  
238 Villere st., New Orleans, La.
- Sawyer, Charles H.,  
53 Main st., Saco, Me.
- Sawyer, Hilon H.,  
118 Michigan st., Chicago, Ill.
- Sawyer, Jno. R.,  
367 Center st., Boston, Mass.
- Sawyer, William F.,  
1152 Tremont st., Boston, Mass.
- Sayers, Milton C.,  
New Hampton, Ia.
- Sayre, Edward A.,  
482 Broad st., Newark, N. J.
- Sayre, Lucius E.,  
University of Kansas, Lawrence, Kan.

- Scallin, Stephen H.,  
 214 Main st., Mitchell, S. Dak.  
 Schaak, Milton F.,  
 108 Penn st., Brooklyn, N. Y.  
 Schachleiter, Francis G.,  
 713 Central ave., Hot Springs, Ark.  
 Schadt, Conrad,  
 Amana, Ia.  
 Schaefer, Emil A.,  
 R. F. D. No. 1, Lynnhaven, Va.  
 SCHAFFER, GEORGE H.,  
 713 Front st., Fort Madison, Ia.  
 Schaffer, Charles,  
 Residence unknown.  
 Schaper, Henry F.,  
 1369 W. North ave., Chicago, Ill.  
 Scheffel, Louis,  
 646 Blue Island ave., Chicago, Ill.  
 SCHEFFER, HENRY W.,  
 c. o. Larkin & Scheffer, St. Louis, Mo.  
 Scheips, Theodor I.,  
 316 Sedgwick st., Chicago, Ill.  
 Schellentraeger, Ernst A.,  
 3361 St. Clair ave. N. E., Cleveland, O.  
 Schenck, Henry,  
 80 Washington Sq., New York, N. Y.  
 Schenk, Fannie K. (Mrs.),  
 Durant, Okla.  
 Scherer, Andrew,  
 383 N. State st., Chicago, Ill.  
 SCHERLING, GUSTAV,  
 1201 4th st., N. Dak.  
 Scheuber, Frank A.,  
 Livingston, Mont.  
 Schieffelin, William J.,  
 170 Williams st., New York, N. Y.  
 Schimelfenig, Charles H.,  
 1002 E. Garfield Blvd., Chicago, Ill.  
 Schimmel, Maurice S.,  
 Biddle st. & Guilford ave., Baltimore, Md.  
 Schimpf, Henry W.,  
 443 W. 34th st., New York, N. Y.  
 Schlabach, Edward J.,  
 225 N. Market st., Canton, O.  
 Schleussner, Chas. F.,  
 198 Ninth ave., New York, N. Y.  
 Schlosser, Peter,  
 124 W. Chestnut st., Louisville, Ky.  
 Schlotterbeck, Augustus G.,  
 36 Brown st., Portland, Me.  
 Schlotterbeck, Julius O.,  
 1319 Israel ave., Ann Arbor, Mich.
- Schlueter, Robert E.,  
 909 Park ave., St. Louis, Mo.  
 Schlup, Samuel, Jr.,  
 503 W. High st., New Philadelphia, O.  
 Schmid, Henry,  
 38 Ave. A., New York, N. Y.  
 Schmidt, F. Joseph,  
 7126 South Chicago ave., Chicago, Ill.  
 Schmidt, Frederick M.,  
 Room 810, Schiller Building, Chicago, Ill.  
 Schmidt, Henry,  
 501 Elizabeth ave., Elizabeth, N. J.  
 Schmidt, Valentine,  
 1885 Polk st., San Francisco, Cal.  
 Schmidt, Walter K.,  
 84 Canal st., Grand Rapids, Mich.  
 Schmitt, Carl,  
 3800 West 25th st., Cleveland, O.  
 Schmitt, Jno. J.,  
 1127 N. Clark st., Chicago, Ill.  
 Schmitter, Jonathan,  
 Maple st., Gypsum City, Saline Co., Kan.  
 Schneck, George E.,  
 Hot Springs, Ark.  
 Schneider, Albert,  
 Calif. Coll. Pharm., San Francisco, Cal.  
 Schneider, Benjamin,  
 Residence unknown.  
 Schneider, Carl H.,  
 411 Bank st., Orion, Ill.  
 Schnell, Harry J.,  
 100 William st., New York City.  
 Schoenhut, Christie H.,  
 199 Superior st., Cleveland, O.  
 Schoenthaler, John P.,  
 3459 Magnolia ave., St. Louis, Mo.  
 Schoettlin, Albert J.,  
 1318 Morton ave., Louisville, Ky.  
 Scholastica, Sister Mary,  
 St. Joseph's Infirmary, Hot Springs, Ark.  
 Scholz, Wm. F.,  
 6927 Kelly st., Pittsburg, Pa.  
 Schopp, Otto,  
 602 S. Illinois st., Indianapolis, Ind.  
 Schramm, Fred. C.,  
 Salt Lake City, Utah.  
 Schrank, C. Henry,  
 437 E. Water st., Milwaukee, Wis.  
 Schreiber, August,  
 8th & Humboldt sts., Tell City, Ind.  
 Schreiner, Robert,  
 440 West 6th st., Plainfield, N. J.

- Schrodt, Jacob,  
c. o. Owl Drug Co., Dallas, Tex.
- Schroeter, Herman M.,  
339½ S. Hill st., Los Angeles, Cal.
- Schubert, John J.,  
65 East ave., Kankakee, Ill.
- Schueller, Frederick W.,  
232 S. High st., Columbus, O.
- Schuh, Paul G.,  
607 Commercial ave., Cairo, Ill.
- Schulte, Alex., Jr.,  
Wynot, Neb.
- Schultz, John J.,  
528 Main st., Lafayette, Ind.
- Schulz, Henry L.,  
305 Telegraph Bldg., Detroit, Mich.
- Schulz, Raymond,  
740 Langdon st., Madison, Wis.
- Schulze, Louis,  
cor. Elliott & Curley sts., Baltimore, Md.
- Schumann, Otto G.,  
837 N. Caroline st., Baltimore, Md.
- Schwartz, Maurice P.,  
2168 Talbot ave., Indianapolis, Ind.
- Schweinfurth, George E.,  
866 6th ave., New York, N. Y.
- Schweitzer, Joseph,  
417 E. 57th st., Chicago, Ill.
- Scott, Alexander W.,  
115 East Mountain ave., Ft. Collins, Colo.
- Scott, Clarence A.,  
Prattville, Ala.
- Scott, Edgar B.,  
276 York st., Norfolk, Va.
- Scott, George T.,  
Franklin Square, Worcester, Mass.
- Scott, Harry,  
636 Park ave., New York, N. Y.
- Scott, William H.,  
1617 17th st., Richmond, Va.
- Scoville, Wilbur L.,  
73 Brainard st., Detroit, Mich.
- Seaman, Frederick A.,  
56 Smith st., Perth Amboy, N. J.
- Searby, William M.,  
Calif. Coll. Pharm., San Francisco, Cal.
- Sears, Charles B.,  
109 Genesee st., Auburn, N. Y.
- Seaverns, Martha G. (Miss),  
81 Concord ave., Cambridge, Mass.
- Seely, Anton H.,  
Canon City, Colo.
- Seidell, Atherton,  
1427 Chapin st., Washington, D. C.
- Seinsoth, John J.,  
11 Main st., Hartford, Conn.
- Seitz, Lorenz A.,  
736 S. 4th st., St. Louis, Mo.
- Seltzer, Leonard A.,  
Shurly Building, Detroit, Mich.
- Selzer, Eugene R.,  
5425 Superior ave. N. E., Cleveland, O.
- Sennewald, Emil A.,  
800 Hickory st., St. Louis, Mo.
- Serodino, Herman,  
5th & Walnut sts., Cincinnati, O.
- Seymour, James,  
University of Maine, Orono, Me.
- Shaak, Franklin P.,  
95 Elm st., Kearney, N. J.
- Shaffer, Erwin C.,  
Green Lane & York Road, Philadelphia, Pa.
- Shannon, Thomas J.,  
7 Main st., Sharon, Tenn.
- Sharp, *Alpheus P.*,  
Pratt & Howard sts., Baltimore, Md.
- Sharp, Solomon A.,  
1845 Polk st., San Francisco, Cal.
- Shaub, Jacob R.,  
602 N. Mary st., Lancaster, Pa.
- Shaw, Fred C.,  
17th & Tremont st., Denver, Colo.
- Sharpless, Stephen P.,  
26 Broad st., Boston, Mass.
- Sheehan, John S.,  
609 Jackson ave., Memphis, Tenn.
- SHEPPARD, SAMUEL A. D.,  
1129 Washington st., Boston, Mass.
- Sherman, Charles R.,  
102 S. 16th st., Omaha, Neb.
- Sherrard, Charles C.,  
Box 588, Angola, Ind.
- Sherriff, Wm. E.,  
Douglass ave., Ellsworth, Kan.
- Sherwood, Henry J.,  
1003 Woodland ave., Cleveland, O.
- Shimer, Samuel M.,  
135 W. Main st., Middletown, N. Y.
- Shoemaker, Clayton F.,  
511 Arch st., Philadelphia, Pa.
- SHOEMAKER, RICHARD M.,  
4th & Race sts., Philadelphia, Pa.
- Shoults, Robert G.,  
Napa, Cal.

- Shreve, John A.,  
Main st., Port Gibson, Miss.
- Shudrowitz, Frank S.,  
Lansing, Kan.
- SHURTLEFF, ISRAEL H.,  
195 Fourth st., New Bedford, Mass.
- Shurtleff, Wilford C.,  
200 Randolph st., Chicago, Ill.
- Siegenthaler, Harvey N.,  
22 E. High st., Springfield, O.
- Siegfried, Henry J.,  
Valley City, N. Dak.
- Siegfried, Howard J.,  
4676 Frankford ave., Philadelphia, Pa.
- Sieker, Ferdinand A.,  
1007 Willow ave., Hoboken, N. J.
- Sieplein, Chas. A.,  
426 Rose Building, Cleveland, O.
- Sievers, Arthur,  
Whittier, Cal.
- Simmons, Frank B.,  
182 Main st., Woonsocket, R. I.
- Simmons, Gustav T.,  
Sharon, N. Dak.
- SIMMS, GILES G. C.,  
1344 New York ave., Washington, D. C.
- Simon, Frank,  
Oakland, Neb.
- Simon, William,  
Edmondson ave., Catonsville, Md.
- Simson, Francis C.,  
Halifax, Nova Scotia, Can.
- Skells, Howard M.,  
Twin Falls, Idaho.
- SKELLY, JAMES J.,  
339 E. 14th st., New York, N. Y.
- Slade, Harry A.,  
10 State st., Montpelier, Vt.
- Slater, Frank H.,  
P.O.Box 10, Mattawan, Monmouth Co., N.J.
- Slauson, John G.,  
160 Genesee st., Utica, N. Y.
- Sloss, Robert A.,  
Pharmacist, Clinton Prison, Dannemora, N.Y.
- Smith, Albert B.,  
91 Bennington st., Lawrence, Mass.
- Smith, Albert H.,  
3428 Frankford ave., Philadelphia, Pa.
- Smith, B. Frank,  
433 Market st., Harrisburg, Pa.
- Smith, Clarence P.,  
861 Broad st., Newark, N. J.
- Smith, Edward W.,  
764 W. 4th st., Williamsport, Pa.
- Smith, Frank M.,  
Holyoke, Colo.
- Smith, F. A. Upsher,  
c. o. Sharp & Dohme, Baltimore, Md.
- Smith, Harley E.,  
14 Pine ave., Long Beach, Cal.
- Smith, Lauriston S.,  
871 N. Raymond ave., Pasadena, Cal.
- Smith, Linville H.,  
701 Centre st., Jamaica Plain, Mass.
- Smith, Owen C.,  
1501 N. Fulton ave., Baltimore, Md.
- SMITH, OTIS W.,  
5th & Engineer sts., Sedalia, Mo.
- Smith, Ralph II.,  
56 Fifth ave., Chicago, Ill.
- Smith, Rufus E.,  
374 S. Salina st., Syracuse, N. Y.
- Smith, Theodric,  
1343 Pennsylvania ave., Baltimore, Md.
- Smith, Walter V.,  
2d & Green sts., Philadelphia, Pa.
- Sniteman, Charles C.,  
Nielsville, Clark Co., Wis.
- Snodgrass, Latta K.,  
120 Main st., Little Rock, Ark.
- Snow, Charles W.,  
214 Warren st., Syracuse, N. Y.
- Snow, Clyde M.,  
358 Dearborn st., Chicago, Ill.
- Snow, Herbert W.,  
10 Franklin st., Chicago, Ill.
- Snow, Levi M.,  
cor. Main & Centre sts., Fairhaven, Mass.
- Snyder, Ambrose C.,  
13½ St. Felix st., Brooklyn, N. Y.
- Soetje, Edward C.,  
96 Broadway, Denver, Colo.
- Sohrbeck, G. Henry,  
3d ave. & 16th st., Moline, Ill.
- Sohrbeck, George W.,  
1601 3d ave., Moline, Ill.
- Sollmann, Luitpold,  
Canton, O.
- Sollmann, Torald,  
1353 E. 9th st., Cleveland, O.
- Solomons, Isaiah A.,  
163 Congress st., Savannah, Ga.
- Sords, Thomas V.,  
315 Pearl st., Cleveland, O.

- Soult, Roy M.,  
2368 N. Claremont ave., Chicago, Ill.
- Southard, Frank A.,  
U. S. Marine Hospital, Cleveland, O.
- Spalding, Warren A.,  
89 Church st., New Haven, Conn.
- Spangler, Lewis C.,  
Savannah Quarantine, Savannah, Ga.
- Spangler, Newton L.,  
104 Oklahoma ave., Guthrie, Okla.
- Sparks, James M.,  
718 Garrison ave., Fort Smith, Ark.
- Spatier, William C.,  
Auburn, Ia.
- Speer, Charles C.,  
St. Augustine, St. Johns Co., Fla.
- Spencer, Jas. W.,  
326 Texas st., Shreveport, La.
- Spiegel, Adolph,  
101 Grand ave., Milwaukee, Wis.
- Spire, Wm. B.,  
1120 C st. S. E., Washington, D. C.
- Sporndli, Ernest,  
917 B st., Haywards, Cal.
- Sprague, John F.,  
c. o. King Drug Co., Raleigh, N. C.
- Sprague, Wesson G.,  
Main st., Flushing, Mich.
- Spring, George A.,  
664 6th ave., New York, N. Y.
- Squibb, Charles F.,  
Bernardville, N. J.
- Stacy, Marion F.,  
5 W. Sale st., Tuscola, Ill.
- Staehle, Louis L.,  
169 S. Orange ave., Newark, N. J.
- Stabel, Albert W.,  
501 Main st., Little Rock, Ark.
- Stahlhuth, Ernest H. W.,  
5th & Washington sts., Columbus, Ind.
- Stamm, Dante M.,  
Geneseo, Ill.
- Stanbarger, Morris H.,  
37 S. Park Place, Newark, O.
- Stanford, William H.,  
256 Mulberry st., Newark, N. J.
- Stange, Carl F.,  
1400 18th st., San Francisco, Cal.
- Stanislaus, I. V. Stanley,  
1715 Cherry st., Philadelphia, Pa.
- Staudt, Albert J.,  
3520 Spring Garden st., Philadelphia, Pa.
- Staudt, Louis C.,  
15 S. Broadway, Aurora, Ill.
- Stearns, Cletus O.,  
U. S. Marine Hospital, Baltimore, Md.
- Stearns, William L.,  
U. S. Quarantine, Pensacola, Fla.
- Stech, Geo. O.,  
203 Linden ave., Sharpsburg, Pa.
- STEELE, JAMES G.,  
1424 Laguna st., San Francisco, Cal.
- Stein, Edward T. N.,  
217 Montgomery st., Jersey City, N. J.
- Stein, Jacob H.,  
801 Penn st., Reading, Pa.
- Steinmeyer, William O.,  
Carlville, Ill.
- Stenbuck, Moses A.,  
423 De Kalb ave., Brooklyn, N. Y.
- Stephenson, John J.,  
1880 Lexington ave., New York, N. Y.
- Stevens, Alviso B.,  
536 Thompson st., Ann Arbor, Mich.
- Stevens, Edward,  
901 Pennsylvania ave., Washington, D. C.
- Stevens, Frederick S.,  
Auburn, Cal.
- Stevenson, Andrew W.,  
Clifton, Ariz.
- Stewart, Alexander,  
61 Wyndham st., Guelph, Ont., Can.
- Stewart, Ernest E.,  
2102 N. Senate ave., Indianapolis, Ind.
- Stewart, Francis E.,  
11 W. Phil-Ellena st., Philadelphia, Pa.
- Stewart, John W.,  
Spadra, Ark.
- Steyh, Geo. P.,  
414 S. Central ave., Burlington, Ia.
- Stichel, William K.,  
43 W. Montgomery st., Baltimore, Md.
- Stier, Carl,  
Box 59, U. S. M. Hospital, Key West, Fla.
- Stier, George F.,  
cor. Ludlow st. & Clinton ave., Cincinnati, O.
- Stimson, Charlotte E. (Miss),  
Mary Thompson Hospital, Chicago, Ill.
- Stoddard, Thomas,  
84 Seneca st., Buffalo, N. Y.
- Stolle, Henry J.,  
4th & Market sts., St. Louis, Mo.
- Stone, Clarence G.,  
273 Rich ave., Mt. Vernon, N. Y.

- Storer, Charles A.,  
 cor. Rush & Ohio sts., Chicago, Ill.  
 Stott, Samuel T.,  
 505 Penna. ave. N. W., Washington, D. C.  
 Stoughton, Dwight G.,  
 204 State st., Hartford, Conn.  
 Stout, Marion A.,  
 Bluffton, Ind.  
 Streeper, Frank P.,  
 Chestnut Hill, Philadelphia, Pa.  
 Strickland, Franklin N.,  
 4 Market Square, Providence, R. I.  
 Stringer, Orum H.,  
 Hopedale, O.  
 Stromberg, Eric W.,  
 Fort Worth Univ., Fort Worth, Tex.  
 Stroup, Freeman P.,  
 145 N. 10th st., Philadelphia, Pa.  
 Strunz, Christopher E.,  
 100 Michigan st., Pueblo, Colo.  
 Stuchlik, John,  
 338 W. 18th st., Chicago, Ill.  
 Stucky, Edward W.,  
 161 N. Illinois st., Indianapolis, Ind.  
 Sturmer, Julius W.,  
 107 Fowler ave., Lafayette, Ind.  
 Sturtevant, Samuel B.,  
 500 Main st., Grand Junction, Colo.  
 Stutzlen, Frank C.,  
 231 3d st., Elizabeth, N. J.  
 Sultan, Frederick W.,  
 4615 Maryland ave., St. Louis, Mo.  
 Sum, Francis,  
 2840 Clark ave., St. Louis, Mo.  
 Suppan, Leo R. A.,  
 2648 Russell ave., St. Louis, Mo.  
 Sutton, Arthur D.,  
 Provo City, Utah.  
 Swain, Harry,  
 13th & Lombard sts., Philadelphia, Pa.  
 Swaringen, DeWitt C.,  
 China Grove, N. C.  
 Sweet, Caldwell,  
 22 W. Market Square, Bangor, Me.  
 Sweet, William H.,  
 1731 Chicago ave., Minneapolis Minn.  
 Symonds, Arthur H.,  
 225 Main st., Conneaut, Ashtabula Co., O.  
 Taborelli, Ernest T.,  
 388 Spring st., West Hoboken, N. J.  
 Takamine, Jokichi,  
 521 W. 179th st., New York, N. Y.  
 Taquechel, Francisco,  
 Obispo 27, Havana, Cuba.  
 Taylor, Augustus C.,  
 201 Maryland av. N. E., Washington, D. C.  
 Taylor, Carleton F.,  
 224 Ouachita ave., Hot Springs, Ark.  
 Taylor, George E.,  
 Denver, Colo.  
 Taylor, Henry L.,  
 2 Woodlawn ave., Albany, N. Y.  
 Taylor, Walter T.,  
 501 N. Main st., Los Angeles, Cal.  
 Teeters, Wilber J.,  
 Iowa Coll. Pharm., Iowa City, Ia.  
 Tepe, Louis,  
 229 E. Columbia st., Evansville, Ind.  
 Terrill, Willis E.,  
 9 State st., Montpelier, Vt.  
 Tesche, Adolph G.,  
 Main st., Mendota, Ill.  
 Thebus, William F.,  
 1101 15th st., Denver, Colo.  
 Thelander, Creston C.,  
 921 4th st., Sioux City, Ia.  
 Thomas, Daniel J.,  
 345 Wyoming ave., Scranton, Pa.  
 Thomas, John B.,  
 Baltimore & Light sts., Baltimore, Md.  
 Thomas, Oscar B.,  
 101 E. Baltimore st., Baltimore, Md.  
 Thomas, Robert, Jr.,  
 108 Broad st., Thomasville, Ga.  
 Thompson, Albert D.,  
 1st ave. S. & 3d st., Minneapolis, Minn.  
 Thompson, Edwin T.,  
 911 W. 7th st., Sioux City, Ia.  
 Thompson, Jno. R.,  
 315 Smithfield st., Pittsburgh, Pa.  
 Thompson, Leon A.,  
 278 Dartmouth st., Boston, Mass.  
 Thompson, Mason L.,  
 Pullman, Wash.  
 Thorburn, Albert D.,  
 316 E. 33rd st., Indianapolis, Ind.  
 Thorn, Henry P.,  
 Main st., Medford, N. J.  
 Thornburgh, Thos. R.,  
 950 Ft. Wayne ave., Indianapolis, Ind.  
 Thorp, Edmund,  
 1410 Davenport st., Omaha, Neb.  
 Thum, John K.,  
 1531 N. Opal st., Philadelphia,

- THURSTON, AZOR,  
     Grand Rapids, Wood Co., O.  
 Thurston, Edwin J.,  
     Mobile Quarantine, Ft. Morgan, Ala.  
 Tielke, Maxwell G.,  
     474 Detroit st., Cleveland, O.  
 Tilton, Claude E.,  
     Fairmount, Ill.  
 Timmons, George D.,  
     458 Greenwich st., Valparaiso, Ind.  
 Tobin, John M.,  
     Narragansett Pier, R. I.  
 Todd, Albert M.,  
     204 N. Rose st., Kalamazoo, Mich.  
 Toner, Robt. T.,  
     1110 Wood st., Wilksburg, Pa.  
 Toplis, William G.,  
     4939 Germantown ave., Philadelphia, Pa.  
 Topping, Arthur E.,  
     Overbrook, Kan.  
 Torbert, Willard H.,  
     756 Main st., Dubuque, Ia.  
 Toulson, Milbourne A.,  
     Chestertown, Md.  
 Tracy, Kenneth W.,  
     344 S. Division st., Ann Arbor, Mich.  
 Traynor, Charles F.,  
     159 Maine st., Biddeford, Me.  
 Treadwell, William P.,  
     568 Elm st., Dallas, Tex.  
 Treasure, John T.,  
     1144 E. 1st South st., Salt Lake City, Utah.  
 Treat, Joseph A.,  
     Stuart, Guthrie Co., Ia.  
 Treber, Frederick W.,  
     301 W. Broadway, Louisville, Ky.  
 Tripp, Arthur H.,  
     573 Talbot ave., Dorchester Center, Mass.  
 Trout, John H.,  
     328 S. Broadway, Los Angeles, Cal.  
 Troxler, Constantine, Jr.,  
     228 W. Breckenridge st., Louisville, Ky.  
 Troxler, Robert F.,  
     U. S. P. H. & M. H. S., Evansville, Ind.  
 Truax, Charles,  
     42 Wabash ave., Chicago, Ill.  
 True, Rodney H.,  
     U. S. Dept. Agriculture, Washington, D. C.  
 Truedson, Eric P.,  
     Puyallup, Wash.  
 Turk, Bascom A.,  
     928 Church st., Galveston, Tex.  
 Turner, Joseph L.,  
     416 S. 13th st., Philadelphia, Pa.  
 Tuthill, Frederick P.,  
     526 Putnam ave., Brooklyn, N. Y.  
 Tuttle, George O.,  
     387 Congress st., Portland, Me.  
 Uhlich, Ferdinand G.,  
     2001 Salisbury st., St. Louis, Mo.  
 Umenhofer, Adolph,  
     1100 N. Halstead st., Chicago, Ill.  
 Utech, P. Henry,  
     209 Chestnut st., Meadville, Pa.  
 Valdes, Eduardo,  
     49 Constitucion st., Matanzas, Cuba.  
 Valentine, William G.,  
     3900 Cottage Grove ave., Chicago, Ill.  
 Van Aller, Thomas S.,  
     210 S. Broad st., Mobile, Ala.  
 Van Antwerp, James G.,  
     250 State st., Mobile, Ala.  
 Van Derveer, Robert H.,  
     Broad & Monmouth sts., Red Bank, N. J.  
 Van Dyke, Charles,  
     3rd South & Main st., Salt Lake City, Utah.  
 Van Ness, George I.,  
     U. S. P. H. & M. H. S., Ft. Stanton, N. Mex.  
 Van Schaack, Cornelius P.,  
     138 Lake st., Chicago, Ill.  
 Van Sickle, George C.,  
     Manila, P. I.  
 Vanderkleed, Charles E.,  
     200 First ave., Collingswood, N. J.  
 Vargas, Jorge,  
     809 Beacon st., Boston, Mass.  
 Varney, Edward F.,  
     1151 Broadway, Oakland, Cal.  
 Vaughan, Parry W.,  
     106 E. Main st., Durham, Orange Co., N. C.  
 Vaughn, Patrick H.,  
     101 Eastlake ave., Seattle, Wash.  
 Vause, H. Russel,  
     47th st. & Cottage Grove ave., Chicago, Ill.  
 Veaco, Sidney H.,  
     East Chicago, Ind.  
 Vernor, James,  
     33 Woodward ave., Detroit, Mich.  
 Villere, Rene L.,  
     1001 Esplanade ave., New Orleans, La.  
 Voegeli, Thomas,  
     Hennepin & Wash. sts., Minneapolis, Minn.  
 Voelker, Edwin B.,  
     New Braunfels, Tex.



- Voigt, Joseph F.,  
840 Market st., Chattanooga, Tenn.
- VOISS, ARCADIOUS,  
395 Wells st., Chicago, Ill.
- Von Stein, John H.,  
Upper Sandusky, O.
- Voorhees, Harry B.,  
901 Washington st., Easton, Pa.
- VORDICK, AUGUST H.,  
Jefferson ave. & Benton st., St. Louis, Mo.
- Voss, Edward, Jr.,  
1201 Vine st., Cincinnati, O.
- Votteler, William,  
Shelby & Oak sts., Louisville, Ky.
- Vowell, Louis S.,  
62 S. Main st., Washington, Pa.
- Waddell, Minor T.,  
1207 Ash st., Indianapolis, Ind.
- Wagner, Arthur C.,  
231 Belmont ave., Everett, Mass.
- Wagner, Louis,  
Mountain View, Cal.
- Wakeman, Nellie A. (Miss),  
706 State st., Madison, Wis.
- Walbrach, Arthur,  
1200 15th st., Denver, Colo.
- Walbridge, Cyrus P.,  
N. E. cor. 4th & Market sts., St. Louis, Mo.
- Waldner, Paul J.,  
Bur. Med. & Surg., Navy Dept., Wash't'n, D. C.
- Walker, Alfred,  
Sutton, W. Va.
- Walker, Chas. H.,  
115 South G st., Tacoma, Wash.
- Walker, Elias R.,  
201 Jefferson st., Huntsville, Ala.
- Walker, Robert,  
756 Bank st., Waterbury, Conn.
- Walker, Robert H.,  
Gonzales, Tex.
- Walker, William A.,  
127 West Georgia st., Indianapolis, Ind.
- Wall, Otto A.,  
4532 Virginia ave., St. Louis, Mo.
- Wallace, John C.,  
61 E. Washington st., New Castle, Pa.
- Wallbann, Carl G.,  
101 W. Third st., Yankton, S. D.
- Walsdorf, Chas. A.,  
Carrollton ave. & Oak st., New Orleans, La.
- Walsdorf, Edw. H.,  
Peters ave. & Magazine st., New Orleans, La.
- Walter, Chas. A.,  
209 S. Austin ave., Oak Park, Ill.
- Walter, Peter G.,  
cor. Chestnut & Liberty sts., Allegheny, Pa.
- Walton, Lucius L.,  
50 W. Fourth st., Williamsport, Pa.
- Walz, J. Lee,  
Walbrook ave. & 13th st., Baltimore, Md.
- Wanous, Josie A. (Miss),  
720 Nicollet ave., Minneapolis, Minn.
- Ward, A. Jae,  
107 E. Pike's Peak av., Colorado Spr'gs, Colo.
- Ward, Enoch J.,  
Front st., Ellisville, Miss.
- Ward, Francis W.,  
15 S. Main st., Memphis, Tenn.
- Ward, Homer B.,  
Rowland, N. C.
- Ware, Charles H.,  
1930 Madison ave., Baltimore, Md.
- Ware, Clarence W.,  
Residence unknown.
- Warfield, James A.,  
Washington, Guernsey Co., O.
- Warn, William E.,  
Lock Box 342 Keyport, N. J.
- Warner, Francis D.,  
137 E. Michigan st., New Carlisle, Ind.
- Warner, Louis H.,  
473 Franklin ave., Brooklyn, N. Y.
- Warner, William R., Jr.,  
639 N. Broad st., Philadelphia, Pa.
- Warren, Lee,  
2703 Montana ave., Billings, Mont.
- Warren, Robert A.,  
Clarksville, Ark.
- Washburn, Homer C.,  
Norman, Okla.
- Wassmann, Louis W.,  
600 E. Ormsby st., Louisville, Ky.
- Watkins, Charles W.,  
227 S. Illinois st., Indianapolis, Ind.
- Watson, Herbert K.,  
803 Market st., Wilmington, Del.
- Watson, Joseph R.,  
330 18th ave. N., Seattle, Wash.
- Watson, William, Jr.,  
202 Genesee st., Utica, N. Y.
- Watt, George H.,  
Pullman, Wash.
- WAUGH, GEORGE J.,  
Ontario st., Stratford, Ont., Can.

- Weaber, John A.,  
     209 S. El Paso st., El Paso, Tex.  
 Webb, Edward N.,  
     277 E. 14th ave., Columbus, O.  
 Webb, John W.,  
     Main st., Stuttgart, Ark.  
 Webber, Arthur H.,  
     Cadillac, Mich.  
 Webber, J. Le Roy,  
     277 Greene ave., Brooklyn, N. Y.  
 Weber, Don C.,  
     Arlington, Neb.  
 Weber, Eugene,  
     Washington Barracks, D. C.  
 Weed, Nelson,  
     411 S. Front st., Mankato, Minn.  
 Weicker, Theodore,  
     78-80 Beekman st., New York, N. Y.  
 WEIDEMANN, CHARLES A.,  
     2148 Green st., Philadelphia, Pa.  
 Weidemann, George B.,  
     2148 Green st., Philadelphia, Pa.  
 Weil, Albert J.,  
     5718 Bartlett st., Pittsburg, Pa.  
 Weilbaecher, Frank E.,  
     6056 Hurst st., New Orleans, La.  
 Weimar, Henry,  
     122 Central ave., Hot Springs, Ark.  
 Weinstein, Abraham,  
     696 Union ave., New York, N. Y.  
 Weinstein, Joseph,  
     75 East Broadway, New York, N. Y.  
 Weiser, Wm. A.,  
     127 E. Jefferson st., South Bend, Ind.  
 Weiser, William P.,  
     501 Market st., Camden, N. J.  
 Weiss, Conrad H.,  
     25 Monroe st., Anacostia, D. C.  
 Weiss, Emil O.,  
     794 6th ave., New York, N. Y.  
 WELLCOME, HENRY S.,  
     Snow Hill Buildings, London E. C., Eng.  
 Weller, Frank P.,  
     755 8th st. S. E., Washington, D. C.  
 Wells, Jas. A.,  
     241 Fifth ave., Chicago, Ill.  
 Wendel, H. Edward,  
     3d & George sts., Philadelphia, Pa.  
 Wendt, William C.,  
     366 S. 4th st., Columbus, O.  
 WENZELL, WILLIAM T.,  
     U.S. Appraiser's Office, San Francisco, Cal.
- Werckshagen, Otto,  
     258 W. Biddle st., Baltimore, Md.  
 Werner, Rudolf C.,  
     2592 Atlantic ave., Brooklyn, N. Y.  
 Werner, Wm. F.,  
     2202 E. 10th st., Indianapolis, Ind.  
 Wescott, William C.,  
     Pacific & Delaware avs., Atlantic City, N. J.  
 Wesner, Henry C.,  
     Windsor, Henry Co., Mo.  
 Westby, Severa,  
     679 E. 3d st., St. Paul, Minn.  
 West, Charles A.,  
     14 Fulton st., Boston, Mass.  
 West, Fred.,  
     2489 Howard st., San Francisco, Cal.  
 Westcott, James W.,  
     423 N. Charles st., Baltimore, Md.  
 Wetterstroem, Theodore D.,  
     3935 Spring Grove ave., Cincinnati, O.  
 Weydell, K. Albus,  
     6501 Cottage Grove ave., Chicago, Ill.  
 Wheatcroft, John C.,  
     Grayville, Ill.  
 Wheeler, A. Alton,  
     270 Woodward ave., Detroit, Mich.  
 Wheeler, Carlton B.,  
     18 Main st., Hudson, Mass.  
 Wheeler, William D.,  
     Sharon, Mass.  
 WHELPLEY, HENRY M.,  
     2342 Albion Place, St. Louis, Mo.  
 Whilden, Charles B.,  
     135 Stockton st., San Francisco, Cal.  
 Whipple, George H.,  
     Broad & Fayette sts., Bridgeton, N. J.  
 White, Albert J.,  
     Dalton, O.  
 White, Charles H.,  
     153 E. 51st st., New York, N. Y.  
 White, Robert C.,  
     412 S. 13th st., Philadelphia, Pa.  
 White, Robin H.,  
     70 Main st., Mt. Sterling, Ky.  
 White, Simeon L.,  
     Houlton, Me.  
 White, Wm. R.,  
     314 Hancock st., Nashville, Tenn.  
 Whitehead, Bowe T.,  
     Brookings, S. Dak.  
 WHITFIELD, THOMAS,  
     240 Wabash ave., Chicago, Ill.

- Whitney, David V.,  
3722 E. 12th st., Kansas City, Mo.
- Whittington, Wm. G.,  
262 Central ave., Hot Springs, Ark.
- Whittle, Wm. A.,  
729 Gorsuch ave., Baltimore, Md.
- Whitworth, Frank E.,  
775 E. 2nd South st., Salt Lake City, Utah.
- Whorton, Carl,  
5th & Chestnut sts., Gadsden, Ala.
- Wicarius, Max J.,  
4861 Cudahy ave., Hawthorne, Ill.
- WICKHAM, WILLIAM H.,  
91 Fulton st., New York, N. Y.
- Wicks, Otto,  
1375 Myrtle ave., Brooklyn, N. Y.
- Wiegand, Thomas S.,  
145 N. 10th st., Philadelphia, Pa.
- WILBERT, MARTIN I.,  
728 20th st. N. W., Washington, D. C.
- Wilbur, Lot,  
Ave. C & 1st. st., Snohomish, Wash.
- Wilcox, Levi,  
22 Mitchell ave., Waterbury, Conn.
- Wiley, Harvey W.,  
Dept. of Agriculture, Washington, D. C.
- Wilkes, George R.,  
500 Main st., Little Rock, Ark.
- Willard, Rowland,  
131 E. Main st., Haddonfield, N. J.
- Willenbrink, Chas. A.,  
512 Pike st., Covington, Ky.
- Willetts, Charles E.,  
Grand ave., Mars, Pa.
- Williams, Edward,  
1 West Main st., Madison, Wis.
- Williams, George G.,  
Residence unknown.
- Williams, John K.,  
391 Main st., Hartford, Conn.
- Williams, Richard W.,  
Notre Dame st., Three Rivers, Que., Can.
- Williams, Seward W.,  
8 Brighton ave., East Orange, N. J.
- Williams, Walter G.,  
Charlotte C. H., Va.
- Williamson, Lee,  
330 W. Baltimore st., Baltimore, Md.
- Williamson, Wylie P.,  
Residence unknown.
- Willis, Henry,  
4 St. John st., Quebec, Can.
- Willman, Wm. G.,  
Adams st., Brownsville, Tex.
- Willson, George A.,  
106 Branch st., Lowell, Mass.
- Wilser, Joseph M. S.,  
608 Front st., Fargo, N. Dak.
- WILSON, BENJAMIN O.,  
46 Canal st., Boston, Mass.
- Wilson, Charles F.,  
902 N. Main st., Rushville, Ind.
- Wilson, Frederick H.,  
82 Main st., Brunswick, Me.
- Wilson, George B.,  
833 W. 6th st., Los Angeles, Cal.
- Wilson, George T.,  
Bowling Green, Ky.
- Wilson, Richard B.,  
866 W. Adams st., Chicago, Ill.
- Wilson, William H.,  
781 Park ave., New York, N. Y.
- Wimmer, Curt P.,  
115 W. 68th st., New York, N. Y.
- Winberg, Washington W.,  
5100 Lake ave., Chicago, Ill.
- WINKELMANN, JOHN H.,  
118 W. Lombard st., Baltimore, Md.
- Winter, Jas. H.,  
1375 Valencia st., San Francisco, Cal.
- Wirth, Adam,  
618 St. Charles st., New Orleans, La.
- Wirthman, J. George,  
1535 Grand ave., Kansas City, Mo.
- Wirthman, Joseph C.,  
18th st. & Troost ave., Kansas City, Mo.
- Wittich, Matthew H.,  
1519 E. Franklin ave., Minneapolis, Minn.
- Witting, Frederick F.,  
Longmont, Colo.
- Wittmer, Joseph W.,  
1347 Clay st., Dubuque, Ia.
- Wolf, Charles A.,  
cor. Broadway & Bank sts., Baltimore, Md.
- Wolf, Frank C.,  
324 S. Los Angeles st., Los Angeles, Cal.
- Wolf, J. Carlton,  
2207 E. Pratt st., Baltimore, Md.
- Wolf, Michael F.,  
Eastern ave. & Chester st., Baltimore, Md.
- Wolff, Edward H.,  
522 Washington ave., St. Louis, Mo.
- Wolff, Gustave,  
246 E. 68th st., New York, N. Y.

WOLTERSDF, LOUIS, 171 Blue Island ave., Chicago, Ill.	Yeomans, Sidney C., 3360 State st., Chicago, Ill.
Wood, Alonzo F., Jr., 2 Church st., New Haven, Conn.	YORSTON, MATTHEW M., 1063 Central ave., Cincinnati, O.
Wood, Horatio C., Jr., 3942 Walnut st., Philadelphia, Pa.	Young, David B., 96 Lincoln ave., Bellevue, Pa.
Wood, James P., 2 Church st., New Haven, Conn.	Young, George O., Buckhannon, W. Va.
Wood, John W., 494 Broadway, Newport, R. I.	Young, Harry G., 7207 Race st., East Pittsburg, Pa.
Woodhall, Frederick, 30 Park Place, Rockville, Conn.	Young, James J., Okolona, Ark.
Woodman, Walter I., St. Augustine, Fla.	Yunker, Charles H., Main st., Charleston, Ark.
Woodruff, Roderick S., 92 Prospect st., Waterbury, Conn.	Zabaldano, Alexander, 1201 Stockton st., San Francisco, Cal.
Woodward, Albert A., Aberdeen, S. Dak.	Zamentowsky, David, 1423 Michigan ave., Chicago, Ill.
Woodworth, Benjamin S., 1002 W. Wayne st., Fort Wayne, Ind.	Zamora, Manuel, 162 St. Sebastian st., Quiapo, Manila, P. I.
Woodworth, Charles B., 254 W. Wayne st., Fort Wayne, Ind.	Zeamer, Harry W., 240 Locust st., Columbia, Pa.
Wooten, Thomas V., N. W. University Bldg., Chicago, Ill.	Zelinski, Walter F. von, 624 W. Adams st., Chicago, Ill.
Wooyenayka, Keizo, 521 W. 179th st., New York, N. Y.	Ziegler, Howard P., 201 Windsor st., Reading, Pa.
Wrensch, Henry E., Jr., 610 Bloomfield ave., Montclair, N. J.	ZIEGLER, PHILIP M., 526 Penn st., Reading, Pa.
Wright, Charles L., Allen & Dougherty sts., Webb City, Mo.	Zimmer, Harry E., 132 E. Washington st., Indianapolis, Ind.
Wuenssch, Charles, 494 Springfield ave., Newark, N. J.	ZOELLER, EDWARD V., Main st., Tarboro, N. C.
Wulling, Frederick J., Minn. University, Minneapolis, Minn.	Zottman, William H., 1 Church st., Burlington, Vt.
Wulzen, Dietrich H., 400 Castro st., San Francisco, Cal.	Zuber, A. E., 5108 Wentworth ave., Chicago, Ill.
Wunderlich, Edward, 1415 Dryades st., New Orleans, La.	Zuenkeler, J. Ferd., 1902 Vine st., Cincinnati, O.
Wyckhoff, Elmer E., 246 E. 5th st., Brooklyn, N. Y.	Zurawski, Narcys J., 4800 Loomis st., Chicago, Ill.
Yellig, Daniel C., 308 Summit st., Pittsburg, Pa.	

#### LIST OF MEMBERS WHO HAVE RESIGNED SINCE PUBLICATION OF THE LAST REPORT.

	Residence.	Elected.
Alexander, David J. K.,	Berkeley, Va.,	1907
Ball, Charles E.,	Holyoke, Mass.,	1885
Bigelow, Charles F.,	Newport, Vt.,	1907
Bothwell, Samuel F.,	Los Angeles, Cal.,	1907
Carpenter, William A.,	Philadelphia, Pa.,	1900

Caseldine, Harry C.,	Georgetown, Ky.,	1907
Cook, Elliott D.,	Trenton, N. J.,	1906
Criswell, Francis M.,	Washington, D. C.,	1892
Dicks, Frederick A.,	New Orleans, La.,	1905
Estenoz, Francisco R.,	Havana, Cuba,	1907
Gale, Abram,	Chicago, Ill.,	1905
Goodman, Laura (Miss),	San Francisco, Cal.,	1907
Griffis, Orville A.,	Aberdeen, S. Dak.,	1906
Harding, George A.,	Oregon City, Ore.,	1907
Henne, Louis E.,	New Orleans, La.,	1905
Henry, Charles (Dworniczak),	Croton-on-Hudson, N. Y.,	1881
Hoyt, George M.,	East Weymouth, Mass.,	1904
Jelliffe, Smith E.,	New York, N. Y.,	1895
Keeling, Francis, Jr.,	Chicago, Ill.,	1905
Kleinschmidt, Augustus A.,	St. Louis, Mo.,	1903
Kistner, Otto E.,	Cincinnati, O.,	1906
Loussararian, Armenag H.,	Washington, D. C.,	1905
McNair, John S.,	Ashland, Ore.,	1902
Monsabert, Arthur C. de,	New Orleans, La.,	1905
O'Leary, James P.,	Cambridge, Mass.,	1907
Porter, Chilton S.,	Somerset, Ky.,	1882
Printup, Daniel,	Augusta, Ga.,	1903
Sale, Howard M.,	Los Angeles, Cal.,	1907
Scofield, J. Walker,	Chicago, Ill.,	1905
Sears, Joseph E.,	Hot Springs, Ark.,	1907
Smith, Willard A.,	Richfield Springs, N. Y.,	1880
Thames, Joseph J.,	Taylor, Tex.,	1895
Timmer, Jacob B.,	Grand Rapids, Mich.,	1904
Tucker, Greenleaf R.,	Boston, Mass.,	1890
Whitehead, Eugene T.,	Scotland Neck, N. C.,	1900
Wiegel, Carl G.,	Pittsburg, Pa.,	1904

LIST OF MEMBERS WHO HAVE DIED SINCE PUBLICATION OF THE  
LAST REPORT.

	Residence.	Elected.
Adams, Henry,	Springfield, Mass.,	1904
Anderson, Samuel,	Bath, Me.,	1876
Andriessen, Hugo,	Beaver, Pa.,	1875
Aughinbaugh, David C.,	Hagerstown, Md.,	1898
Burrough, Horace,	Baltimore, Md.,	1883
CASPER, THOMAS J.,	Springfield, O.,	1867
Eyssell, George,	Kansas City, Mo.,	1889
Fisk, Frank E.,	Chicago, Ill.,	1902
Gausby, Robert A.,	Cleveland, O.,	1904
Kalish, Julius,	New York, N. Y.,	1875
Klein, Nicholas,	Louisville, Ky.,	1907
Lindsay, Robert A.,	East Brady, Pa.,	1907
Lord, Thomas,	Chicago, Ill.,	1882
Lusby, Robert H.,	Hot Springs, Ark.,	1907
Martenson, Johannes (Honorary),	St. Petersburg, Russia,	1882

Miller, Jacob A.,	Harrisburg, Pa.,	1873
Muth, George L.,	Baltimore, Md.,	1894
Palmer, J. Dabney,	Monticello, Fla.,	1902
Riley, Russell,	St. Louis, Mo.,	1901
<i>Rollins, John F.,</i>	Dover, N. H.,	1859
Schmidt, Florian C.,	Chicago, Ill.,	1882
Schneck, Charles,	Hot Springs, Ark.,	1907
SEABURY, GEORGE J.,	New York, N. Y.,	1876
Sombart, John E.,	Wilmore, Kan.,	1881
STACEY, BENJAMIN F.,	Charlestown, Mass.,	1860
Timberlake, Arthur,	Indianapolis, Ind.,	1902
Voss, George W.,	Cleveland, O.,	1885
Wangler, Conrad D.,	Waterloo, Ia.,	1876
WINTER, JONAS,	Hagerstown, Md.,	1863

LIST OF MEMBERS DROPPED FROM THE ROLL FOR NON-PAYMENT OF  
DUES ACCORDING TO ARTICLE III, CHAPTER VIII,  
OF THE BY-LAWS.

(PUBLISHED IN ACCORDANCE WITH A GENERAL RULE ADOPTED AT MONTREAL, CANADA,  
AUGUST, 1896. SEE PAGE 17, VOL. 44, PROCEEDINGS).

Name.	Residence.	Elected.
Ackenhausen, William A.,	Kansas City, Kan.,	1904
Alexander, John M.,	Tchula, Miss.,	1905
Allen, Earl,	Unionville, Ia.,	1905
Allen, William E.,	Monroe, La.,	1905
Allen, William H.,	Detroit, Mich.,	1902
Alwin, William G.,	New Ulm, Minn.,	1904
Arnold, Ethelyn B.,	Watseka, Ill.,	1905
Aron, Frank X.,	Pittsburg, Pa.,	1905
Bachelle, Percy von,	Chicago, Ill.,	1905
Baguley, Clarence B.,	Chicago, Ill.,	1905
Barnes, Walter E.,	Chicago, Ill.,	1906
Beckenbach, Edward,	Cleveland, O.,	1904
Berry, Robert H.,	Cynthiana, Ky.,	1903
Betzler, Jacob,	Morristown, N. J.,	1880
Blakely, Collins,	Montpelier, Vt.,	1899
Boesewetter, Richard,	St. Louis, Mo.,	1902
Bonnette, James V.,	Pollock, La.,	1902
Bradham, Caleb D.,	New Bern, N. C.,	1902
Bradley, Linn,	Spokane, Wash.,	1904
Bramblett, Oscar E.,	Pelzer, S. C.,	1905
Breece, Charles A.,	Martinsburg, O.,	1905
Breunert, August,	Kansas City, Mo.,	1901
Brill, Paul D.,	Richton, Miss.,	1905
Bristow, Thomas G.,	Newport, R. I.,	1904
Brown, John O.,	Sarasota, Fla.,	1905
Brunor, Emile,	New York City,	1904
Birdsal, Albert H.,	Residence unknown,	1904
Burke, Madge A. (Miss),	Edinburg, Pa.,	1905

Byrud, John,	Chicago, Ill.,	1905
Campbell, William L.,	Baltimore, Md.,	1905
Carmack, George W.,	Plattsburg, Mo.,	1903
Carney, Frank,	Littleton, W. Va.,	1905
Carter, Frederick J.,	St. Louis, Mo.,	1905
Christoph, Geo. B.,	Norfolk, Neb.,	1905
Clark, Harry S.,	Uniontown, Pa.,	1905
Claverie, Joseph S.,	Covington, La.,	1904
Cloonan, Martin J.,	Pontiac, Mich.,	1904
Cobb, Henry C.,	Muskogee, Okla.,	1905
Cochrane, William W.,	Atchison, Kan.,	1904
Collins, Albert N.,	St. Louis, Mo.,	1905
Cooper, Oscar H.,	Stanford, Texas,	1904
Cowan, John,	New York City, N. Y.,	1897
Cummings, John A.,	Mount Pleasant, Pa.,	1905
Daniels, Wilbur W.,	Seiling, Okla.,	1905
Darbaker, Leasure K.,	Pittsburg, Pa.,	1905
Davenport, Emmet H.,	Granite, Okla.,	1905
Davidson, Edgar C.,	La Grange, Ga.,	1902
Davis, George B.,	New Orleans, La.,	1904
Davis, Geo. W.,	Scranton, Pa.,	1905
Davis, Harry R.,	Kansas City, Mo.,	1904
DeLang, Alfred,	Cincinnati, Ohio,	1887
Dexter, Thomas H.,	Conneaut, Ohio,	1905
Dickey, Charles F.,	Kansas City, Mo.,	1904
Dickinson, Arthur L.,	Danbury, Conn.,	1900
Douglass, Henry,	Brooklyn, N. Y.,	1875
Dosier, William A.,	Hattiesburg, Miss.,	1905
Drach, George L.,	Cleveland, Ohio,	1902
Drake, Wallace C.,	Cleveland, Ohio,	1902
Duggan, James,	Hartford, Conn.,	1894
Durkee, William C.,	Boston, Mass.,	1885
Dutmers, Cornelius J.,	Grand Rapids, Mich.,	1905
Egbert, Seneca,	Philadelphia, Pa.,	1905
Elliott, Cassius E.,	Sheridan, Ind.,	1904
Elsner, Fred. H.,	Chicago, Ill.,	1906
Engelsburg, Paul,	Pittsburg, Pa.,	1905
England, Thos. M.,	Fort Ward, Wash.,	1904
Englander, Samuel,	Brooklyn, N. Y.,	1895
Euler, Frederick C.,	St. Louis, Mo.,	1901
Evans, William J.,	Iola, Kans.,	1909
Feinberg, Maurice M.,	New York, N. Y.,	1905
Felker, Walton A.,	Williamstown, Mo.,	1904
Flack, Herbert L.,	Philadelphia, Pa.,	1905
Fly, Anthony,	Residence unknown,	1905
Ford, Myron N.,	Delphos, Ohio,	1905
French, Rolland H.,	Cincinnati, Ohio,	1903
Fulton, Peter M.,	Burke, S. D.,	1901
Gehrun, John M.,	Cleveland, Ohio,	1905
Geisler, Leo W., Jr.,	New York, N. Y.,	1904
Gray, Will. W.,	Moundsville, W. Va.,	1905
Greensfelder, Harry,	St. Louis, Mo.,	1904

Gregory, Charles A.,	Council Grove, Kan.,	1904
Griffiths, Joseph G.,	Fowler, Kan.,	1901
Groner, Wm. C., Jr.,	Dallas, Texas,	1905
Gsell, Earl W.,	Evanston, Ill.,	1905
Haley, John B.,	New Castle, Pa.,	1902
Hamilton, William G.,	Bridgeport, Conn.,	1905
Hammond, E. Emmet,	Meridian, Miss.,	1905
Hanson, George C.,	Chicago, Ill.,	1905
Harper, Grace I. (Miss),	Mt. Union, Pa.,	1905
Harrell, Preston B., Jr.,	Marion Junction, Ala.,	1905
Harris, Norman B.,	New York, N. Y.,	1904
Hartman, Frank C.,	Middletown, Conn.,	1905
Hazard, Elmer C.,	Shrewsbury, N. J.,	1902
Herbert, Joseph H.,	Point Coupee, La.,	1905
Henrion, Walter S.,	Wichita, Kan.,	1904
Hetzl, Chauncy R.,	Connellsville, Pa.,	1905
Hill, Frank R.,	Waynesburg, Pa.,	1905
Hill, Wm. G. C.,	Cameron, W. Va.,	1905
Hoelzer, Bruno A. C.,	Chicago, Ill.,	1905
Hogan, John J.,	New Haven, Conn.,	1890
Hollander, Joseph M.,	Rankin, Pa.,	1905
Holt, Julian W.,	Meridian, Miss.,	1905
Houck, Paul W.,	Shenandoah, Pa.,	1905
Humphries, John R.,	Meridian, Miss.,	1905
Hutchinson, Currie J.,	Tampa, Fla.,	1905
Hyde, Milton W.,	Ellisville, Miss.,	1905
Itizarri, Miguel P.,	Tampa, Fla.,	1903
Jones, Ernest,	Canton, O.,	1905
Kerr, Frederick W.,	Port Richmond, N. J.,	1905
Keyser, George F.,	New Martinsville, W. Va.,	1905
Killeen, William P.,	New Orleans, La.,	1904
Kinnison, Virgil A.,	Welch, Okla.,	1904
Klor, Alex. E. G.,	Newport News, Va.,	1899
Klotz, Gus. O.,	Vallejo, Cal.,	1905
Koencke, Charles H.,	St. Louis, Mo.,	1901
Kolar, Gustave S.,	Chicago, Ill.,	1905
Kosminsky, Leonce J.,	Texarkana, Ark.,	1902
Lake, Claude C.,	Residence unknown,	1905
Lanning, Adrian R.,	Dennison, Ohio,	1904
Larsen, John T.,	New Orleans, La.,	1904
Lauer, Joseph W.,	Winona, Minn.,	1904
Lauricella, Felice,	Boston, Mass.,	1896
Lebovitz, Louis,	Homestead, Pa.,	1905
Lehritter, George,	Freehold, N. J.,	1902
Leiper, James A., Jr.,	Sewanee, Tenn.,	1904
Lewis, Isaiah G.,	Chicago, Ill.,	1905
Lo Sardo, Antonio,	New York, N. Y.,	1902
Lord, Frederick W.,	Residence unknown,	1905
Maguire, Thomas J.,	Baton Rouge, La.,	1905
Malloy, Michael J.,	Duquesne, Pa.,	1905
Malloy, William B.,	Alleghany City, Pa.,	1905
Malony, Patrick J.,	Mindanao, P. I.,	1905



Martin, David G.,	Lancaster, Pa.,	1905
Mason, William L.,	Phillipi, W. Va.,	1905
Mayhew, Earle W.,	Demos, Ohio,	1905
McAteer, James W.,	Residence unknown,	1905
McFadden, Warren L.,	Detroit, Mich.,	1902
McGarr, Cuvier L.,	Franklin, Pa.,	1905
McIlravy, Maude J. (Miss),	Magnolia, Ohio,	1903
McKay, Malcolm,	Washington, D. C.,	1905
Metcalfe, Alexander H.,	Residence unknown,	1905
Miller, Mark E.,	Stanford, Texas,	1905
Moran, William P.,	Farmington, W. Va.,	1905
Murbach, John E.,	Chicago, Ill.,	1905
Murphy, Charles O.,	Holloway, Ohio,	1904
Murray, Julius V.,	Warrensburg, Mo.,	1905
Nance, Fuller,	Baltimore, Md.,	1905
Neil, John G.,	Dunedin, New Zealand,	1905
Neuberger, Joseph A.,	Cleveland, Ohio,	1904
Neves, George,	Ellis Island, N. Y.,	1904
Nicholson, Gilbert W.,	Durant, Miss.,	1905
Nicholson, Ralph B.,	Dresden, Ohio,	1905
Noaks, Richard S.,	Residence unknown,	1905
Nordlander, Anders G. E.,	Boulder, Colo.,	1905
Oertel, Alfred A.,	Cleveland, Ohio,	1903
Oxford, Albert,	Goldthwaite, Texas.,	1904
Oyster, John H.,	Paola, Kans.,	1904
Parramore, George B.,	Eureka, Fla.,	1904
Patten, Eustis,	Carbondale, Ill.,	1900
Peck, Percy S.,	Grand Rapids, Mich.,	1903
Pederson, Geo. M.,	Harlan, Ia.,	1905
Pennock, Edward,	New York, N. Y.,	1898
Philibert, Leon D.,	St. Louis, Mo.,	1901
Polk, Martin L.,	Laurel, Miss.,	1904
Pond, Raymond H.,	New York, N. Y.,	1903
Quales, Iver L.,	Chicago, Ill.,	1905
Reemie, Edgar W.,	Hyde Park, Mass.,	1905
Rex, Clarence R.,	Toledo, Ohio,	1905
Reymond, John P.,	Kansas City, Mo.,	1903
Richardson, Thomas W.,	New Orleans, La.,	1904
Riely, Louis S.,	Corydon, Ind.,	1904
Risbeck, John M.,	Brownsville, Pa.,	1905
Robins, Wilbur F.,	Littleton, N. H.,	1892
Rowles, Walter D.,	New York, N. Y.,	1905
Sandholm, John A.,	Des Moines, Ia.,	1904
Sawyer, Edward S.,	New York, N. Y.,	1904
Schanher, Paul,	Mt. Clemens, Mich.,	1905
Schreiner, Louis I.,	Chicago, Ill.,	1905
Schumacher, Albert J.,	St. Paul, Minn.,	1904
Scott, Henry R.,	Corsica, Pa.,	1905
Sheridan, William F.,	Residence unknown,	1904
Simonson, Louis,	Boston, Mass.,	1904
Skinner, William H.,	Pocahontas, Ark.,	1905
Smith, Joseph H.,	Pittsburg, Pa.,	1905

Smith, John S.,	Brunswick, Ga.,	1903
Smithson, David E.,	Emmett, Idaho,	1890
Smythe, Wm. R.,	Pittsburg, Pa.,	1905
Snow, Frederick A.,	Topeka, Kan.,	1904
Sorency, Robert,	Warrensburg, Mo.,	1903
St. John, Sidney S.,	Boise, Idaho,	1897
Stern, Augustus O.,	Cleveland, Ohio,	1904
Stewart, Harry E.,	Jacksonville, Fla.,	1903
Stolz, Otto G.,	Chicago, Ill.,	1905
Stowe, Ernest A.,	Grand Rapids, Mich.,	1904
Swann, Samuel V. B.,	New York, N. Y.,	1903
Tallman, Lewis L.,	Walla Walla, Wash.,	1904
Temm, William D.,	St. Louis, Mo.,	1901
Trust, Edward,	Pittsburg, Pa.,	1905
Vincent, Frederick A. C.,	Kansas City, Mo.,	1904
Voellger, Ernest H.,	Pittsburg, Pa.,	1905
Wade, Guy L.,	Webb City, Mo.,	1905
West, Walter L.,	McKeesport, Pa.,	1905
Whitcomb, Frederick E.,	St. Louis, Mo.,	1888
Whitsitt, Lee M.,	Ft. Worth, Texas,	1905
Whittet, James,	Residence unknown,	1905
Wikle, Jesse Lane,	Anniston, Ala.,	1898
Wisdom, Hugh,	Chicago, Ill.,	1901
Wolcott, Abraham L.,	Philadelphia, Pa.,	1903
Zorn, Emil,	Cincinnati, O.,	1904
Zwick, Albert O.,	Cincinnati, O.,	1904
Zwick, Karl G.,	Covington, Ky.,	1894

# INDEX.

- A.
- Absinthe liqueur, cultivation of plants for its production, 72  
oils, relative turbidity produced by diluting their alcoholic solutions with water, 312
- Acaroides resin oil, 309
- Acetanilide, expeditious determination, 401
- Acetone collodion, B. P. C., 70  
new reaction applicable to its detection in urine, 372
- Achillea millefolium, characters of volatile oils from whole plant and flowers, 208
- Achlys triphylla, new coumarin plant, 223
- Acid, anhydrous hydrocyanic, cause of spontaneous explosion, 272  
arsenic, determination as such in urine, 300  
hydrates of, dissociation, 300  
attractylis, 209  
benzoic, estimation in catsup, 373  
vs. cinnamic, caution in food analysis, 372  
citric, normal constituent of wine, 375  
ellagic, presence in raspberries, 379  
gallotannic, constitution, 378  
glycerophosphates, preparation and advantages, 355  
hydriodic, syrup of, assay, 127  
hydrochlor., dil., U. S. P. VIII, assay of commercial samples, 260  
hydrocyanic, anhydrous, cause of spontaneous explosion, 272  
nature of the black product of its decomposition, 272  
hypovanadic, isomeric hydrates, 290  
iod-formic, 156  
ipurolic, 203  
methylencitrylsalicylic, 160  
oleic, presence, detection and removal of iron, 360  
percarbonic, saline compounds, 271  
sodium salts of, 271  
permanganic, isolation and characters, 291  
phosphates, solution, N. F. unsatisfactory formula, 97  
phosphoric, iodometric method of estimation, 267  
utility of silver nitrate in the volumetric determination, 268  
phosphorous, determination, 267  
salicylic, detection of free phenol, 376  
succinyl-salicylic, 166  
sulphuric, product of the combustion of illuminating gas, 265  
syphon, for carbons, 61  
tartaric, detection in cider, 375  
determination in presence of malic and succinic acids, 375  
vanillin-hydrochloric, 428
- Acids, arsenic and arsenous, complete precipitation by baryta, 301  
cinnamic and benzoic, separation and estimation, 373  
organic, determination in fruit juices, 370  
wines, together with alcohol and glycerin, 371  
new class of iron salts, 370
- Acocanthera venenata and A. spectabilis, South African arrow-poison plants, 205
- Acorn oil, 141
- Aconine, oxidation products, 383
- Aconite, fallaciousness of the assay process of the U. S. P., VIII, 219
- Aconitine, new reaction, 384
- Active digitalis glucosides, distinctive reactions, 413
- Adams, Henry, obituary notice, 1083
- Addendum to treasurer's report, 482
- Address, chairman's, F. M. Apple, 945  
Jacob Diner, 558  
Joseph W. England, 602  
Virgil Coblenz, 759  
of welcome on behalf of the Arkansas Med. Assoc., 522  
president's, Wm. M. Searby, 447
- Ade biscuits, 141
- Adeps benzoïnatus, U. S. P., VIII, manipulation, 136
- Adjustable powder measure, new device, 111  
tenakel, construction, 42
- Adrenine, antagonistic action of choline, 438  
antitoxine, production from rabbits, 438  
coloration of its solutions, 437  
inhalant, formula, 104  
method of testing oily preparations, 438  
ointments, formulas, 156  
reaction with iron, 437  
suppositories, formula, 122
- Aepfelkakao, 141
- Aerated distilled water, production, 63
- Æther orthotomicus, 141
- Æthon, 141
- Æthrin, 142
- A few suggestions, 563
- African ammoniacum, botanical source, 217  
copals, chemical investigation, 254
- A further study of the alkaloids of gelsemium, 851
- Aglycones, 402
- Albumen, new reaction, 424  
reaction with vanillin-hydrochloric acid, 425
- Albumens, vegetable, biological method of differentiation, 424
- Albuminoid-derivatives, chemical exposé, 423
- Albumins, new solvents useful for their separation, 424
- Alcohol and ether, rapid estimation in their admixtures, 346  
dehydration with lime, 346  
estimation in galenical preparations, 346  
extract, 203  
new percentage tables, 345  
recovered, table for its convenient conversion into menstrua of required strength, 345  
table to facilitate rapid approximate determinations of alcohol by apparent specific gravity, 906
- Alcoholic potash, preparation, 274
- Alcuenta, 142
- Alcapon, 142
- Algie, fresh water, saccharine constituent, 176
- Alkali iodides, detection of nitrates, 261
- Alkaloid determination in leaves and roots, errors from saponaceous compounds, 381  
determinations, precaution when shaking out chloroform, 381  
estimations, recent progress, 381
- Alkaloidal assay, simple, general method, 380  
chemistry, progress in 1906, 379  
determinations, chronological review from 1806-1906, 180  
double salts with ferric chloride, preparation and characters, 382  
nomenclature, plea for uniformity, 379

- Alkaloidal picrolonates, additional description, 382  
 Alkaloids, calumba, formulas and constitution, 394  
   cinchona, indicators to replace hæmatoxylin in titration, 386  
   further extension of the picrolonic acid method of determination, 381  
   volatile, new, isolation from a number of plants, 379  
 Allergin, 142  
 Allopseudoconeine, new isomer of codeine, 392  
 Allyl-mustard oil, volumetric determination, 310  
 Almond, bitter, water, increase of yield, 67  
 Almonds, bitter, effect of heat on the amygdalin and emulsion, 236  
   oil of, substitution of benzaldehyde in commercial oils, 311  
 Aloe-emodin trimethylether, 411  
 Alophen, 142  
 Alphabetical list of members, 1135  
   names of members from whom money has been received by the treasurer for annual dues or certificates from July 1, 1907, to July 1, 1908, 1073  
 Aluminum sulphides, preparation and convenient use for preparing H<sub>2</sub>S, 278  
 Amendment to the by-laws, 469  
 Amendments to by-laws, adopted, 514  
   proposed, 458, 470  
 American oil, pennyroyal, constituents, 333  
 A method of preparing lime water that insures conformity with the U. S. P. requirements, 1033  
 Ammonia-free water, efficient apparatus, 65  
   synthesis from its elements, 275  
   in presence of water, 275  
 Ammoniacal cuprous sulphate, preparation and composition, 283  
 Ammonium amalgam, constitution and characters, 284  
   calcium sulphate, formula, 276  
   carbonate, protection from deterioration, 275  
   uranate, therapeutic use, 297  
 Amphicome emodi, new Indian drug, 204  
 Ampules, importance of glass, 59  
 Amygdalin, character of saccharine derivative, 407  
   hydrolysis by emulain, 407  
   pure, 236  
 Amygdonitril-glucoside, natural constituent of *Cerasus padus*, 407  
*Anderson, Samuel*, obituary notice, 1083  
*Andriessen, Hugo*, obituary notice, 1083  
 Andolin, 142  
 Angola copal, 253  
 Anhydrous hydrocyanic acid, cause of spontaneous explosion, 272  
   metallic bromides, preparation from metallic oxides, 261  
 Aniline dyes, non-toxic kinds, 400  
 Animal charcoal, decolorizing action, 271  
 Anise, Russian, adulteration with coriander, 218  
   star, false, occurrence in French commerce, 223  
   grouping of species according to the number of carpels, 221  
   poisonous, seat of poison and simple method of identification, 223  
 Aniseed-buchu, new variety, 227  
 A note on the separation of emulsions for analysis, 178  
 Answers to some of the questions propounded, 560  
   the chairman's questions, 561  
 Antimonium sulphuratum, unsatisfactory process, 302  
 Antimony and potassium tartrate, reaction with iron and aluminum compounds, 376  
 Anti-opium remedy from Chungking, botanical source, 209  
 Antiperiostin, 142  
 Antipyrine, very sensitive reagent, 401  
 Antrihemul, 143  
 Antitulae, 143  
 Antyase, 143  
 Aphrodine, 143  
 A plea for real pharmacy, 1041  
 Apomorphine, alcohol as a preservative of its solution, 393  
   method of preparing stable solutions, 393  
 Apparatus, automatic extraction, 35  
   emulsifying, construction, 74  
   extraction, 37  
   for distillations in high vacuum, 45  
   vacuum distillation, 44  
   titration, new, 33  
*Apple, F. M.*, chairman's address, 945  
   greetings from the N. A. R. D., 446  
   Notes on Several New Elixirs, 1026  
 Appropriation, additional, for account of certificates, 462  
 Arbutin, optical properties and composition, 410  
 Argoferment, 143  
 Aristolochia serpentaria, 172  
*Army, H. V.*, Commercial Training As Applied to Laboratory Work, 685  
   and *O. H. Dawson*, Solution of Chlorinated Soda, 841  
 Aromatic elixir, red, 1027  
   syrups, extraction of drug with syrup, 125  
 Arsenic acid, determination as such in urine, 300  
   hydrates of dissociation, 300  
   and arsenous acids, complete precipitation by baryta, 301  
 Arsenogen, 143  
 Arsenitriesterol, 143  
 Arsenyl-sodium tartrate, preparation, 376  
 Arsin sulphates, compounds with the sulphates of potassium, calcium and lead, 301  
 Arsoiodin, 144  
 Artemisia cina, oil of, terpineol a constituent, 312  
 Arterenol hydrochloride, 144  
 Arthritis, 144  
 Articles, rubber, preserving liquids, 56  
 Artificial calamines, use in dermatological practice, 281  
   honey, recognition, 255  
 Asarum blumei, yield and characters of volatile oil, 185  
   canadense, oil of, yield and characters, 311  
 Aseptol, 144  
 Ash determination of drugs, color no positive criterion of identity, 178  
   in organic drugs, method for determining its alkalinity, 178  
   some common drugs, 177  
   of drugs, determination of alkali-content, 177  
 Asiatic licorice root, superior quality, 241  
 Asklerosol, 144  
 Asperrin, 144  
 Aspidium marginale and osmunda claytoniana, 181  
 Assay, alkaloidal, simple general method, 380  
   of preparations of gelsemium, 856  
   opium, increase of morphine-precipitate on prolonged standing, 233  
 Atomic combining values, 259  
 Atoxyl, 145  
   and arrhenal, delicate test for recognition and distinction, 145  
   composition, 145  
 Attractylic acid, 200  
 Atractylis gummifera, poisonous glucosidal constituent of the root, 208  
 Atropine, synthesis and yield, 384  
 Aucubin, 411  
 Auditing committee, v  
   appointment, 460  
   report of, 467  
*Austin, William C.*, obituary notice, 1083  
 Austrian belladonna leaves, scopola atropoides the adulterant, 196  
 Autoclave, double, for sterilizing liquids lighter than water, 49  
 Automatic extraction apparatus, 35  
   filter-funnel, 38  
   measuring funnel, 24  
 Auxiliary committee on the N. F., appointment, 461  
 Ayapana oil, constituents, 313

## B.

- Bacteria, phosphorus a constituent of fatty matter, 179
- Balsam, Hardwickia, botanical sources, 241  
of fir emulsion, formula, 78  
Peru, synthetic, distinctions from the natural product, 238  
test for distinguishing genuine from artificial balsam, 238  
segura, possible adulterant for copaiba, 241
- Barium acid glycerophosphate, details of preparation, 355  
salts, 278
- Bark, simaruba, constituents, 227  
yohimbi, chemical tests, 216
- Barks, cinchona, histology of some varieties, 213  
cinnamon, ash-content of commercial sorts and quality, 188
- Barta, 146
- Bartelli, Geo. C., name ordered to be placed on list of life members old style, 462
- Basic quinine tannate, composition, 388
- Bayberry fat, chemistry, 361
- Beal, Jas. H., communication relative to committee on standards for non-official drugs and chemicals, 469  
election as third vice-president, 474  
report of chairman of Council on savings accounts and bonds, 466
- Bear's grease, product from the Himalayan bear, 361
- Beasley, R. S., Public Conveniences are Good Advertisements, 566
- Bechicin, 146
- Beeswax, solubility in ether at the ordinary temperature, 256
- Belladonna, assay, 196  
extracts, variation in alkaloid content, 78  
leaves, Austrian, scopola atropoides the adulterant, 196  
false, report on microscopic examination, 196  
substitution by poke leaves, 195
- Benguela copal, 254
- Benzaldehyde, pharmacopœial assay, 311
- Benzene, determination of carbon bisulphide, 307
- Benzidine, variable commercial character, 398
- Benzin, safety, 1038
- Benzoates, solubilities, 373
- Benzoic acid, estimation in catsup, 373  
vs. cinnamic acid, caution in food analysis, 372
- Benzoin, exceptional sample, 206  
insoluble matter in commercial samples, 206
- Benzol, detection in alcohol, 307
- Benzoylsuperoxyd, 146
- Bergamot, oil of, adulterated specimens, 315  
constants, adulterants, etc., 315  
value of acid number for detecting adulteration, 313
- Beringer, Geo. M., Fluidglycerates, 981
- Berries, marqui, used to color wines, 229
- Beryllium chromates, preparation and composition, 278  
proof of divalence, 278
- Beta-barbaloin, a new isomeride, 411
- Belle oil, new constituents, 316
- Betuneparol, 146
- Biliary pigments, detection in urine by means of eosin, 419
- Biocitin, 146, 147
- Birch leaf oil, 310
- Bismuth benzoate, preparation, 374  
hydroxide, formula for, 1014  
oxide, hydrated, formula for, 1014  
subgallate, modification of U. S. P. test for free acid, 378  
subnitrate, light, superiority over the heavy variety, 289  
presence of ammonia in commercial samples and test, 289
- Bismuth subsalicylate, more liberal U. S. P. limit of free acid, 377
- Bismuthi hydroxidum, 1010
- Bisol, 147
- Bissulin, 147
- Bitter almond water, increase of yield, 67  
almonds, effect of heat on the amygdalin and emulsin, 236  
principles of calumba, investigation, 412
- Bitterless cascara, effects of magnesia not detrimental, 246
- Black pepper, ground, estimation of quality, 246  
microscopical and chemical examination, 245
- Blair, H. C., Construction of Official Formulæ, 1023
- Blaud-atoxyl capsules, 147
- Blenogonin, 147
- Bleno-lenicet ointment, 147
- Blood, detection by means of benzidine paper, 425  
oranges, artificial coloration and sweetening, 231
- Blower, water-jet, construction, 50
- Blumea balsamifera, culture experiments in Tonquin, 209  
laciniata, 209
- Blumenschein, F. J., Simple Elixir, 1028
- Board of canvassers, report of, iv
- Bonain's mixture, 147
- Bond, John B., election as chairman of Section on Historical Pharmacy, 1071
- Borides of iron, preparation and properties, 268  
nickel and cobalt, preparation and properties, 269
- Boroveritin, 147
- Boryl (ethyl borosalicylate), 148
- Bottle filler, for thick liquids, 58  
washer, construction, 60
- Bottles, glass, brown, spontaneous fractures, 59  
shelf, how to keep in place, 60
- Bougies, iodoform, formula, 123
- Bowman, W. M., election as associate on Committee on Commercial Interests, 601
- Brock, Gustavus E., obituary notice, 1083
- Bromglidine, 148
- Bromides, anhydrous metallic, preparation from metallic oxides, 261
- Bromine, microchemical detection, 260
- Bromotussin, 148
- Bronchiline, 148
- Broom flowers, 174
- Brown glass bottles, spontaneous fractures, 59
- Brucea antidysenterica, examination of fruit, 225  
sumatrana, medicinal uses in China, 226
- Buchu, concentrated infusion of, formula, 89  
leaves, new variety, 227
- Budget, proposed, for 1908-09, 465
- Bulletin, report of committee on, 517
- Bunsen burner, new, 53
- Buphane toxicaria, South African plant, 183
- Burdock, cultivation, 210
- Burke, William H., obituary notice, 1082
- Burner, Bunsen, new, 53
- Burrough, Horace, obituary notice, 1083
- Butter, tongue, characters and constants, 364
- By-laws, amendments to, adopted, 514  
proposed, 470  
of the A. Ph. A., 1086  
Council, 1096
- C.
- Cacao, 228  
shells, copper a content in some sorts, 228
- Cachets, 111
- Caffeine-less coffee, process of manufacture, 214
- Calamines, artificial, use in dermatological practice, 281
- Calcium carbide, synthesis on a small scale, 271  
chloride, method of determining official quality, 277  
its properties and possibilities, 277
- California eucalyptus oils, development of the industry, 323

- Call for reports of special and standing committees, 471
- Calomel oil or cream, formula, 104
- Calumba alkaloids, formulas and constitution, 394
- bitter principles of, investigation, 412
- bulk of active principles in the cortex, 224
- researches on the alkaloidal and bitter principles, 224
- root, false, characters, 225
- Cameroon copal, 253
- Camphor, cultivation experiments in France and Algeria, 187
- di-iod, preparation and characters, 319
- liniment, estimation of camphor by means of polariscope, 91
- variations in camphor content, 91
- mercury derivatives, 318
- method of distinguishing the natural from the artificial product, 317
- oil, d-limonene a constituent, 317
- production in Formosa, 188
- racemic, therapeutic identity with natural camphor, 318
- spirit of, 118
- estimation of camphor, 118
- synthetic, review of patented processes, 317
- Camphosol, 148
- Canarium commune, yield and characters of the fat from the seeds, 242
- Candidus, P. C.*, letter of greeting, 458
- Cannabis americana, 249
- Cantharides, 254
- microscopic examination of the powder, 254
- Cantharidin, melting-point, 412
- soap, 117
- Canvassers, report of board of, iv
- Caoutchouc, progress in determining available plants in the German-African colonies, 247
- Caprina, 148
- Capsulæ geloduratæ, 149
- Carbohydrates, color-reactions with chlorauric acid, 365
- Carboneol, 149
- Carboterpin, 149
- Caricin, 149
- Carlsbad salt, artificial, necessity for pharmacopœial tests, 139
- Carnauba palm, slow development, 181
- Caropan, 149
- Carrot seed oil, constants, 320
- Cascara, bitterless, effects of magnesia not detrimental, 246
- Casein, preparation for replacing egg-albumen, 427
- Caspari, Chas., Jr.*, election as general secretary, 516
- report of committee on publication, 466
- report of general secretary, 483
- Casper, Thomas J.*, obituary notice, 1083
- Castor oil and benne oil, contamination with zinc, 238
- determination in oil mixtures, 363
- emulsion, soap as emulsifier, 75
- emulsions, various formulas, 76
- Cataplasms of kaolin, formula satisfactory, 69
- points for its preparation, 69
- Catgut, chromic, Lord Lister's method of preparation, 139
- Cedarwood oil, chemistry of the hydrocarbon constituent, 320
- Cedrene, main constituent of cedar oil, 321
- Celastrus scandens, proximate examination of the fruits, 247
- Cellulose filters, for large operations, 41
- Cephalotaxus drupacea, 252
- pedunculata, 253
- Cerasus padus delarb., 237
- Ceridin, 149
- Ceylon cardamom oil, sabinene a constituent, 320
- Chairman of Council, report on savings accounts and bonds, 466
- Chairman's address, F. M. Apple, 945
- Jacob Diner, 558
- J. W. England, 602
- Virgil Coblenz, 759
- Champaca oil, source and composition, 321
- Charcoal, animal, decolorizing action, 271
- Cheese and milk, bitterness due to aldehyde resin, 427
- Chelidonium oil, 310
- Chemical compounds, inorganic, 258
- of the U. S. P., 258
- Chemistry, alkaloidal, progress in 1906, 379
- medicinal, effect of exposure to greatly reduced temperatures, 258
- Cheney, A. L.*, election as associate on Committee on Commercial Interests, 601
- Chenopodium oil, superior anthelmintic value, 322
- Cherry laurel water, 67
- Chimaphila umbellata, efficiency in diabetes, 208
- Chinese rhubarb, botanical source, 190
- Chininum nuclecinum, 149
- Chloral hydrate, assay, 349
- quantitative determination, 350
- utility of its solution as a solvent in chemical and microscopical work, 351
- menthols, definite compounds, 351
- Chloride of antimony, solution, formula, 98
- Chlorinated lime soap, 117
- soda solution, action on glass containers, 102
- Chlorocodide, products of hydrolysis, 392
- Chloroform, 202
- ethyl chloride in the product from alcohol, 349
- Chloroforms of aconite and belladonna, reliability of B. P. Codex formulas, 93
- Chloromorphide, products of hydrolysis, 391
- Chocolate syrup, formula, 125
- Cholauranol, 149
- Cholestrin, occurrence, physical characters, constitution and chemical relations, 435
- salicylic acid-ester, 436
- Chromic anhydride, new acidimetric test, 290
- catgut, Lord Lister's method of preparation, 139
- Chromium, characteristic reaction, 290
- sulphate, new, conditions of formation and properties, 290
- Chrysyl (zinc boropicate), 150
- Cinchona alkaloids, indicators to replace hæmatoxylin in titration, 386
- barks, histology of some varieties, 213
- seeds, presence of alkaloids, 213
- Cinchonine, formation of a new base by the action of nitric acid, 387
- Cineol, determination in eucalyptus and cajuput oils, 324
- Cineral, 150
- Cinnamic and benzoic acids, separation and estimation, 373
- Cinnamon barks, ash-content of commercial sorts and quality, 188
- Circulatory displacement, 34
- Citric acid, normal constituent of wine, 375
- Citrocoll, 150
- Citro-compounds of iron, position of the iron, 293
- Citronella oil, dextro-rotary kind from Java, 322
- Clark, A. H.*, Sketch of Walter B. Küner, 1070
- Classification of the quantitative statements of the U. S. P., 890
- Cliffe, W. L.*, A Method of Preparing Lime Water that Insures Conformity with the U. S. P. Requirements, 1033
- Closet, drying, improved, 48
- vacuum, new form, 48
- Coblenz, V.*, Our Pharmacopœial Rubrics, 759
- and *Otto May*, Comparison of Volumetric Methods for the Estimation of Phosphoric Acid, 874
- Deterioration of Diluted Hydrocyanic Acid, 1879

- Coblentz, V., and Otto May*, Testing of Bismuth Salts for Arsenic, 881
- Coca, cultivation of small-leaved variety in Java, 232
- Cocaine and tropacocaine, fluorescent properties of their hydrochlorides, 388  
hydrochloride, effect of sterilization on its solutions, 389  
residues, new basic by-product, 389
- Cochineal, estimation of coloring value, 255
- Cod-liver oil emulsion, formula, 77  
iodo-ferrated, cause and prevention of darkening, 104
- Coeliacin, 150
- Coffalic acid, 214
- Coffee, acid constituents, 213  
caffeine-less, process of manufacture, 214
- Collapsible tube filler, 57
- Collinsonia canadensis, constituents, 200
- Collodia, 70
- Collodium, acetone, B. P. C., 70
- Collodium anodynum, formula, 70
- salicylatum c. anæsthesin, Unna-formula, 70  
c. extract. cannab., Unna-formula, 70
- Colloidal arsenium, preparation and characters, 300
- Colored marking pencils, preparation, 120
- Coloring matters, detection in spices by a modification of Martin's butter-color method, 418
- Colorless hydrastis, 1034
- Combretum raimbaulti, West African fever remedy, 235  
sundaicum, proximate examination, 235
- Commercial crude drugs, variation in activity, 174  
egg-yolk, distinction of the yolk of hen's eggs from that of duck's eggs, 257  
training as a factor in the teaching of pharmacy, 681  
applied to laboratory work, 685
- Commercialism in drugs, 597
- Committee, auditing, v  
appointment, 460  
report of, 467  
general, on membership and reception, viii  
report of, 540  
nominating, report of, 473  
selection of, 472  
of arrangements, local, for 1908 meeting, 460  
on centennial fund, v  
appointment, 460  
commercial interests, vi  
compensation for chairman of committee on N. F., 475  
credentials, appointment of, 467  
report of, 472  
drug market, x  
report of, 765  
supplementary, report of, 775  
reform, ix  
Ebert Prize, vi  
report of, 765  
finance, v  
appointment, 460  
historical pharmacy, vii  
membership, v  
appointment, 460  
national and state legislation, vi  
report of, 712  
National Formulary, x  
auxiliary, appointment, 461  
report of, 487  
synopsis of recommendations of, 493  
syllabus, report of, 750  
organization of local branches of the A. Ph. A., vii  
parcels post, ix
- Committee, parcels post, report of, 591  
patents and trade-marks, ix  
pharmaceutical education and legislation, vii  
practical pharmacy and dispensing, vii  
president's address, appointment, 456  
report of, 485  
action on, 486  
proposed pharmaceutical collection at Washington, vii  
publication, v  
appointment, 460  
report of, 466  
publicity, vii  
report of, 532  
relations of the A. Ph. A. to the N. A. R. D., vii  
reorganization, vii  
report of, 546  
scientific papers, vi  
standards for unofficial drugs and chemical products, ix  
standards for unofficial drugs and chemical products, election of, 521  
status of pharmacists in the army navy, and public health and marine hospital service of the United States, ix  
status of pharmacists in the government employ, report of, 513  
temperance and its relation to pharmacy, appointment of, 691  
the Bulletin, x  
report of, 517  
Wm. Procter, Jr., monument fund, vii  
report of, 533  
time and place of next meeting, vii  
report of, 524  
transportation, vi  
appointment, 460  
U. S. Pharmacopœia, vi  
report of, 526  
supplementary, report, 530  
weights and measures, ix  
report of, 538  
to arrange details of transfer of the treasurership, 521  
canvass names for membership on the committee on food and drug standards, 520  
consider report on National Formulary propaganda, appointment of, 582  
consider report on National Formulary propaganda, action on report, 601  
draft resolutions in regard to advertisement of fraudulent preparations, 578  
report on the propriety of the A. Ph. A. uniting with the International Congress for the Repression of the Adulteration of Alimentary and Pharmaceutical Products, appointment, 462
- Committees, special, vii  
standing, vi
- Communications from executors of Ebert estate, 517
- Comparison of volumetric methods for the estimation of phosphoric acid, 874
- Compound elixir of hexamethylenamine, 1016  
orange flowers, 1026  
glycerite of hydrastine, 1024  
iron mixture, formula, 103  
licorice powder, objection to sweet components, 113  
resorcinol ointment, N. F., manipulation, 138  
solution of sodium phosphate, U. S. P., 980  
syrup of squill, 949

- Compounds, chemical, inorganic, 258  
of the U. S. P., 258
- Concentrated infusion of buchu, B. P. C. formula, 89  
infusions and decoctions, non-reliability, 89  
nitrous ether, estimation of alcohol content, 348
- Condenser, new form, 46  
reflux, new form, 47
- Congo copal, 254
- Constant-level water-bath, 47
- Constitution of the A. Ph. A., 1085
- Construction of official formulae, 1093
- Coody, A. S., Pharmacist and Physician, 1056
- Cook, E. Fullerton, Syrups of the U. S. Pharmacopoeia, 951
- Copaiba, adulteration with Hardwickia balsam, 240  
new test for gurjun balsam, 239
- Copal, Angola, 253  
Benguela, 254  
Cameroon, 253  
Congo, 254
- Copals, African, chemical investigation, 254  
West African, varieties, solubilities and constituents, 253
- Copper albuminate, indefinite composition, 425  
metallic, precipitation, 289  
mirrors, possible industrial production, 283
- Cor, 150
- Coriander oil, products from worm-eaten and sound fruits, 322
- Corning, Albion Y., obituary notice, 1083
- Cosmetic mold, simple and inexpensive, 61
- Cotoneaster microphylla, prelaursin the cyanogenetic constituent of the leaves, 237
- Cotton, iodoform, and gauze, 68
- Council, by-laws of, 1096  
chairman of, report on savings accounts and bonds, 466  
committees of, v  
members of, v  
minutes of, 459, 475, 516, 534  
officers of, v  
since its organization, xvii  
report of secretary of, 468
- Cream, toilet, or massage ointment, 972
- Creosot-carbonate, artificial decoloration, 358
- Crucibles, platinum, cause of instability, 53
- Crude and powdered drugs at the port of New York during the year 1907-08, 783  
drugs, adulterations and substitutions, 175  
commercial, variation in activity, 174
- Crystallized chlorophyll, characters, 419  
composition and source, 419
- Cubebin, formula and constitution, 412
- Cucumis trigonus, colocynthin-like constituents in the fruits, 234
- Cunila mariana, 172
- Curcuma oil, chemistry, 323
- Cyclolimonylidenepropenal, new violet odor from citral, 329
- Cypripedium pubescens, 172
- Cyprus origanum, perennial plant, 200
- D.
- Darman, 150
- Day, W. B., report of general committee on membership and reception, 540
- Decilan, 150
- Delegates from the N. A. R. D., greetings, 446  
to the National Association of Retail druggists, x  
N. A. R. D., report of, 545  
National Wholesale Druggists Association, x  
report of, 531  
section on pharmacology of the American Medical Association, x  
report of, 543
- Delphinium ajacis, a common source of commercial larkspur seeds, 220
- Dermatological powders, formulae, 111
- Deterioration of diluted hydrocyanic acid, 879
- Determinations, alkaloidal chronological review from 1806-1906, 380
- Dewdney, W. L., remarks as delegate of the N. W. D. A., 447
- Dextrin paste, formula, 106
- Diaspirin, 150
- Diehl, C. L., election as reporter on progress of pharmacy, 516  
letter relative to the work of committee on N. F., 454  
report on the progress of pharmacy, 1
- Digalen, 151
- Digitalin and digalen, solubilities and distinctions, 413
- Digitalis, comparison of tinctures prepared from fresh and dried leaves, 104  
does digitoxin represent the therapeutic value of the drug? 194  
glucosides, active, distinctive reactions, 413  
physiological examination, 192  
preparation, 193  
relative toxicity of first and second years' leaves, 192
- Di-iod camphor, preparation and characters, 319
- Dimentholformal, 151
- Dimethylmethylether, 151
- Dimethylaminophenyl arsinic acid, preparations and characters, 399
- Diner, Jacob, chairman's address, 558
- Dioform, 151  
(acetylendichloride), 151
- Diphtheria antitoxin, standardization, 437
- Dishes, evaporating, new form, 53
- Dispensing and laboratory notes, 1034
- Displacement, circulatory, 34
- Distillation, vacuum, apparatus for, 44
- Distillations in high vacuum, apparatus for, 45
- Distilled water, aerated, production, 63
- Dithymol, compounds with chlorine, 344  
pure, preparation, 344
- Diniodin, 152
- Dohme, A. R. L. and H. Engelhardt, Oil of Sandalwood, 811  
H. Engelhardt, Purity of Some Official and Non-Official Drugs and Chemicals, 814
- Dohme, C. E., greetings from Scotland, 535
- Double autoclave, for sterilizing liquids lighter than water, 49  
separatory, useful device, 38
- Drennan, Dr. C. T., address of welcome on behalf of Arkansas Med. Assoc., 522
- Drescher, August, obituary notice, 1083
- Drug assaying, 177
- Drugs and chemicals, adulterations, 176  
official testing, 259  
commercial crude, variation in activity, 174  
crude, adulterations and substitutions, 175  
powdered, microscopic examination, 177  
sophistication with exhausted material, 176  
vegetable, adulterations and substitutions, 174  
some neglected plants, 173
- Drying closet, improved, 48
- Dunning, H. A. B., Protein Compounds with the Heavy Metals, 845  
Some Interesting Prescriptions, 1017
- Dyes, aniline, non-toxic kinds, 400
- E.
- Earths, yttrium, separation by fractional crystallization of their bromates, 279
- Eberle, E. G., election as first vice-president, 474  
secretary of Section on Historical Pharmacy, 1071
- Ecalen, 152
- Ecgonine, estimation in crude cocaine and Java coca, 390



- Egg-yolk, commercial, distinction of the yolk of hen's eggs from that of duck's eggs, 257
- Eglatol, 152
- Eiselfango, 152
- Eiselle, M. A., appointment as chairman of local committee of arrangements for 1908 meeting, 459
- Eisensorisin, 152
- Eldred, Frank R., Sampling of Drugs and Preparation for Assay, 831  
and W. C. Bartholow, Note on the Separation of Emulsions for Analysis, 838  
C. M. Pence, Notes on the Estimation of Hydrastine, 836
- Election of applicants for membership, 520, 521  
honorary president, 475  
officers for 1908-09, 474, 516  
1909-1910, 474  
of Council, 534  
of Section on Commercial Interests, 601  
Historical Pharmacy, 1071  
Pharmaceutical Education and Legislation, 705  
Practical Pharmacy and Dispensing, 1010  
Scientific Papers, 850
- Electric water still, efficient apparatus, 66
- Elemi, Manila, source and characters, 243  
new reactions, 242
- Elixir aromaticum rubrum, 1027  
aurantii florum compositum, 1026  
calicii et sodii glycerophosph. arom, 1036  
curassao, N. F., 70  
dulce, 1026  
rubrum, 1027  
e succo liquiritiæ, formula for the G. P., 71  
practical manipulation, 70  
ferri quiniæ et strychninæ phosphatum, U. S. P. viii, formula satisfactory, 71  
quiniæ et strychninæ phosphatum, U. S. P. viii, improved formula, 71  
glycerophosphates compound, 72  
glycerophosphat comp. cum calisaya, 1036  
of diethylbarbituric acid, 1016  
hexamethylenamine, compound, 1016  
orange flowers, compound, 1026  
veronal, 1016  
simple, 1028  
sweet, 1026  
terpin hydrate, 72  
and codeine sulphate, 72  
heroin, 72
- Elixiria, 70
- Elixirs, terpin hydrate, formulas, 72
- Elkin, W. S., Jr., Answers to the Chairman's Questions, 561
- Ellagic acid, presence in raspberries, 379
- Elm tree galls, presence of a new carbohydrate, 250
- Emetine, new reactions, 395
- Emich, Columbus V., obituary notice, 1083
- Emplastra, 73
- Emplastr. hydrargyri molle, Unna, formula, 73
- Emulsa, 73
- Emulsin, 431
- Emulsio olei gynoecardiæ, Unna, formula, 78  
morrhue c. hypophosphitibus, U. S. P. viii, modification of manipulation, 77
- Emulsion, balsam of fir, formula, 78  
castor oil, soap as emulsifier, 75  
cod-liver oil, formula, 77
- Emulsions, castor oil, various formulas, 76  
method of detecting soap, 75
- Emulsifying apparatus, construction, 74
- Emulsite, 73  
formula of the Belgium "Formulaire," 73
- Engelhardt, H. and H. W. Jones, The Detection of Phenol and Cresotic Acids in Salicylic Acid and its Derivatives, 866
- England, F. W., chairman's address, 602  
election as chairman of Section on Pharmaceutical Education and Legislation, 705  
election as secretary of Council, 534
- English lavender oil, abnormal specimen, 328  
oil of rosemary, optical rotation, 338  
peppermint, temperature of menthol separation, 333
- Entertainments at the fifty-sixth annual meeting, 1072
- Ephedrine, production from pseudoephedrine, 395
- Ergot, Russian, compared with ergots produced elsewhere, 179
- Eriobotrya japonica, cyanogenetic glucoside of the seeds, 237
- Erythronium americanum, 172
- Erythroquinine reaction, 387
- Estimation of phenol, the, 824
- Estimations, alkaloidal, recent progress in, 381
- Eston, 158
- Ether, 202
- Ethyl acetate, 203
- Ethyl chloride, prolonged anæsthesia by a mixture with oxygen, 347
- Ethylene and ethene chlorides, useful solvents for extractions, 347
- Eubornyl, 152
- Eucalyptus oil, determination of eucalyptol by the aid of resorcinol, 324
- Eucerin, 152
- Eucerinum anhydricum, 152
- Euferral, 152
- Eugenol and isoeugenol, action of oxydases, 323
- Eunan, 152
- Euphorbium, false composition, 248
- Eupneuma, 153
- Eustenin, 153
- Evaporating dishes, new form, 53
- Extract, meat, detection of yeast, 79
- Extracta, 78
- Extraction apparatus, 37  
automatic, 35
- Extractor, Soxhlet, modification, 37
- Extracts, belladonna, variation in alkaloid content, 78  
flavoring, pharmacopœial standards desirable, 140
- Extractum ferri pomati, components, 78  
determination of iron, 79
- visci albi aquosum, preparation, 80
- Eysell, George, obituary notice, 1083
- F.
- False belladonna leaves, report on microscopic examination, 196  
calumba root, characters, 225  
euphorbium, composition, 248  
star anise, occurrence in French commerce, 223
- Farase, 143
- Fat, bayberry, chemistry, 361
- Fats, garcinia, varieties and constants, 230
- Fatty ointment bases, method of benzoinating, 133
- Feigl, 153
- Fell, Joseph, The Acetic Acid Fluidextracts of the U. S. P. viii, 883
- Fermentation saccharometer, convenient form, 368  
simple form, 367
- Ferratonal, 153
- Ferri carbonas saccharatus, prevention of oxidation during manipulation, 112
- Ferrogen, 152
- Ferroplasma, 153
- Ferrous carbonate, determination in the presence of sugar, etc., 294  
nascent, solution, formula, 102  
solution, formula, 101  
sulphate, satisfactory commercial quality, 295
- Ferrum oxydatum saccharatum solubile, G. P., necessity of care and experience in the preparation, 113  
pulveratum, test for copper, 292

- Ferula communis*, 218  
*Field, Claud*, obituary notice, 1083  
 Filler, bottle, for thick liquids, 58  
 Filter-funnel, automatic, 38  
     paper, presence of copper, 42  
     papers, for pharmaceutical operations, 41  
     suction, for precipitates, 43  
 Filters, cellulose, for large operations, 41  
 Filtration and extraction of fine precipitates, 43  
     on a large scale, 39  
 Finance, general rules of, 1099  
 Fine precipitates, filtration and extraction of, 43  
 Fire insurance, 593  
 Fixed oils, acetone solubility a new physical constant, 359  
 Fixin, 153  
 Flask supports, forms, 55  
 Flavoring extracts, pharmacopœial standards desirable, 140  
 Flowers, tea, use and superiority for making tea, 229  
 Fluidextract, belladonna leaves, assay process, 80  
     cascara sagrada, improved formula, 84  
     colchicum seed, 81  
     ergot, improved process, 81  
         limit of pharmacological activity, 82  
     frangula, 84  
         distinction from cascara sagrada, 85  
     hydrastis, assay, 82  
         rapid method of assay, 83  
     ipecac, method of assay unsatisfactory, 83  
 Fluidextracts, 80  
 Fluidextracts, 80  
     pressure percolator for, 35  
     variation in alcohol content due to precipitates, 80  
 Fluidextractum cynosbati tamarindinum, 153  
     fuci vesiculosi, estimation of iodine, 86  
     glauci, 153  
     kanakugi, 153  
     nardostachys, 154  
     rhamni purshianæ aromaticum, precautions when making large quantities, 83  
     sennæ, alcohol used for its preparation, 85  
     thymi compositum, formula, 85  
 Fluidglycerate of aconite, 985  
     anthemis, 985  
     apocynum, 986  
     asclepias, 986  
     belladonna leaves, 986  
         root, 986  
     berberis, 987  
     calumba, 987  
     cascara sagrada, 987  
         aromatic, 988  
         bitterless, 987  
     castanea, 988  
     caulophyllum, 988  
     chimaphila, 988  
     chirata, 989  
     cimicifuga, 989  
     cinchona, 989  
     coca, 989  
     coffee, 990  
     colchicum corni, 990  
         seed, 990  
     colocynth, 991  
     conium, 991  
     cotton root bark, 991  
     cyripedium, 992  
     digitalis, 992  
     dioscorea, 992  
     ergot, 992  
     eupatorium, 992  
     frangula, 993  
     gambir, 993  
     gelsemium, 993  
     gentian, 994  
     geranium, 994  
     glycyrrhiza, 994  
 Fluidglycerate of guarana, 994  
     haematoxylin, 995  
     hamamelis bark, 995  
         leaves, 995  
     hellebore, 995  
     hops, 995  
     hyoscyamus, 996  
     hydrastis, 996  
     ipecac, 996  
     krameria, 88, 996  
     lappa, 997  
     lobelia, 997  
     marrubium, 997  
     matricaria, 997  
     nutgall, 998  
     nux vomica, 998  
     orange peel, 998  
     pareira, 999  
     phytolacca, 999  
     pilocarpus, 999  
     pomgranate, 999  
     quassia, 1000  
     quillaja, 1000  
     red clover, 1000  
         rose, 1000  
     rhubarb, 1000  
     rhys glabra, 1001  
     rubus, 1001  
     rumex, 1001  
     salvia, 1001  
     sanguinaria, 1001  
     sarsaparilla, 1002  
     scoparius, 1002  
     scutellaria, 1002  
     senega, 1002  
     senna, 1003  
     spigelia, 1003  
     squill, 1003  
     stillingia, 1003  
     stramonium, 1004  
     sumbul, 1004  
     taraxacum, 1004  
     tea, 1004  
     triticum, 1004  
     uva ursi, 1005  
     valerian, 1005  
     veratrum viride, 1005  
     viburnum opulus, 1005  
         prunifolium, 1005  
     white oak, 1006  
     wild cherry, 1006  
 Fluidglycerates, 981  
     new type of liquid preparations, 98  
 Fluorine, occurrence in snail-shells, 262  
 Foods, predigested, 432  
 Forase, 153  
 Formaldehyde, carbazole a new reagent, 353  
     polymeric modifications, 352  
     production by the action of magnesium on carbon dioxide and formic acid, 352  
     solutions, influence of light and heat not very pronounced, 353  
 Formidin, 154  
 Formulas recommended for introduction into the N. F., 1034  
 Frangula and aloe-emodin trimethylethers, 411  
 French oil, thyme, odorless crystalline deposit, 343  
     rose oil, culture and extraction, 337  
 Fresh water algae, saccharine constituent, 178  
 Fruit juices, concentrated, production and characters, 121  
     prohibitory decisions regarding salicylic acid as preservative, 120  
 Funnel, automatic measuring, 34  
     filter, automatic, 38  
     separatory, improved tap, 38  
 Fused potassium hydroxide, percentage of KOH too high, 274  
 G.  
 Gallotannic acid, constitution, 378  
 Galls, elm tree, presence of a new carbohydrate, 250  
 Gall stones, identification, 437

Garcinia fats, varieties and constants, 230  
 Gas generator, construction for analytical work, 264  
     simple, device for analytical operations, 264  
 Gastric juice, acceleration of its secretion by iodine preparations, 432  
*Gathercoal, E. N.*, The Percentage of Moisture in Commercial Starches, 887  
*Gaultheria procumbens*, 172  
*Gausby, Robert A.*, obituary notice, 1083  
 Gauze, iodoform, formula, 67  
*Gelatina zinci ichthyol*, Unna, formula, 87  
     oxydat. dura, Unna, formula, 87  
     Unna, formula 87  
 Gelatinæ, 86  
 Gelsemine and Gelseminine, 396  
 Gelsemium, 205  
     a further study of the alkaloids of, 851  
     sempervirens, 172  
 General committee on membership and reception, viii  
     rules, of finance, 1099  
 Generator, gas, construction for analytical work, 264  
     simple, device for analytical operations, 264  
 Gentian, adulterated powder, 204  
     percolate, 89  
 Geranium oil, adulteration with gurjun balsam, 325  
 Ginger, examination, 184  
     phenolic characters of pungent principle, 185  
 Ginseng, alkaloidal constituents, 219  
     ignorance of the gatherers a source of substitution, 219  
 Glass bottles, brown, spontaneous fractures, 59  
*Glirghorn, J. S.*, Fire Insurance, 593  
 Glucosides, detection by means of emulsin, 406  
     systematic classification, 401  
 Glycerin, solvent properties on salts, etc., 353  
     suppositories, modification for stock quantities, 122  
     vs. sugar, 354  
 Glycerita, 87  
 Glycerite of hydrastine, compound, 1034  
 Glyceritum amyli, U. S. P. VIII, manipulation, 89  
     hydrastinæ compositum, 1034  
     tonicum compositum, formula, 89  
 Glycerophosphates of mercury, preparation and composition, 356  
 Glycoextract, new class of preparations, 87  
 Glycogelatinum, B. P. C., improved formula, 86  
 Gold chloride, 302  
*Good, James M.*, Notes and Suggestions on the Cerates and Ointments, 972  
*Gordin, H. M.*, On the Crystalline Alkaloid of *Calycanthus Glauca*, 805  
*Gorgas, G. A.*, A Few Suggestions, 563  
 Graduate holder, simple, 55  
 Graminose breast syrup, 154  
     tablets, 154  
 Graphite, oxidizing and decolorizing properties, 270  
 Grease, bear's, product from the Himalayan bear, 361  
 Greetings from army pharmacists in the Philippines, 457  
     Cuban pharmacists, 457  
 Grindelia, 210  
     substitution by *Mizonella minima*, 210  
 Griserin, new, 154  
 Ground black pepper, estimation of quality, 246  
     ivy oil, 370  
     -nut oil, test for its presence in other oils, 362  
 Guaco, application of the name in South America, 182  
 Guaiacol, preparation of phosphoric acid ethers, 358  
 Guaiaicum-resin oil, 310  
 Guajacolate, 154  
 Guajacose, 154  
 Guajadol, 154  
 Guathymine, 155  
 Gum tragacanth and gum arabic, commercial sorts, 241

H.

Hæmostogen, Lœffler, 155  
 Hæmatopan, 155  
 Hageen, 155  
*Halberg, C. S. N.*, publication plan for a journal to be devoted to acquainting physicians with official pharmacy, 519  
*Hammar, Alrik*, remarks as delegate of the U. S. N., 445  
*Hancock, J. F.*, report of committee on the Wm. Procter monument fund, 533  
*Harbold, J. T.*, The Opportunity of the Hospital Pharmacist in Advancing the U. S. Pharmacopœia and National Formulary Propaganda, 1046  
 Hardwickia balsam, botanical sources, 241  
 Harmful effects of our pharmacy laws, 743  
*Havenhill, L. D.*, The Desirability of More Elaborate Pharmacopœial Standards, 930  
*Hays, F. B.*, report of reporter to the public press, 546  
*Hedeoma pulegiodes*, 172  
 Heidyl, 155  
 Helianthus tubes, value as a food-crop, 211  
 Heliofer, 155  
 Helium, abundant presence in samarskite and other uranium minerals, 263  
 Hematoxylin, value as an indicator in the titration of phosphoric acid, 420  
 Hemoglobin, application of guaiaconic acid as a test, 426  
 Heracleum giganteum oil, characters and yield, from seed, 325  
 Here and there, 564  
 Heretin, 155  
 Heroin and veratrine, application of the "Lloyd Reaction," 393  
 Herrabol myrrh, chemical investigation, 243  
 Hirudin, investigations concerning its action on blood, 426  
 Historian, the, report of, 1071  
 Holder, graduate, simple, 55  
 Homorenon hydrochloride, 156  
 Honey, acid content, 255  
     artificial, recognition, 255  
 Honorary president, election of, 475  
 Horse powder, Scotch, formula, 114  
*Howell, E. V.*, Early Pharmaceutical Laws of Great Britain, 1070  
     Tea Cultivation in North Carolina, 1070  
     The Crude Drug Business in North Carolina, 1070  
 Husinol, 156  
 Hydrargyri et potassii iodidum, criticism of formulas and composition, 286  
 Hydrargyrium cum creta, U. S. P. tests not too stringent, 114  
     oxydatum via humida paratam, proposed formula for the G. P., 286  
 Hydrastine, compound glycerite of, 1034  
     estimation in fluidextract of hydrastis, 396  
 Hydrastis, colorless, 1034  
     cultivation, 220  
     rhizomes, 174  
 Hydrated chloral, action of magnesium hydroxide, 351  
 Hydrates of arsenic acid, dissociation, 300  
 Hydriodic acid, syrup of, assay, 127  
 Hydrocyanic acid, nature of the black product of its decomposition, 272  
 Hydro-ergotinine sulphate, confirmation of crystallinity, 396  
 Hydrogen sulphide, pure, preparation, 264  
 Hydropyryn, 156  
 Hydroxycoffeine, preparation and characters, 396  
     sodium benzoate, 397  
*Hynson, H. P.*, Answers to Some of the Questions Propounded, 560  
     election as member of Council, 474  
     Importation of Opium, Coca, and their Chief Alkaloids, 640

*Hyoscyamus muticus*, high percentage of alkaloidal content, 197  
 substitution for *hyoscyamus niger* and *atropa belladonna*, 197  
*Hypodermic injection* of strychnine cacodylate and sodium glycerophosphate, 94  
 solutions, sterilization, 93  
*Hypovanadic acid*, isomeric hydrates, 290  
*Hyssop oil*, chemistry, 325

I.

*Ichthylol pessaries*, preparation, etc., 123  
 solubility, 123  
 variation in composition, 305  
*Importation* of opium, coca and their chief alkaloids, 640  
*Ince, Joseph*, obituary notice, 1083  
 India rubber, synthetic rubber vs. substitutes, 248  
*Indigotin*, reaction with potassium permanganate, 421  
*Infusion* of quassia, B. P., 90  
*Infusions and decoctions*, concentrated, non-reliability, 89  
*Injectio resorcini comp.* Unna, formula, 94  
*Injektion Hirsch*, 156  
*Inorganic chemical compounds*, 258  
*Insect powder*, active constituent, 211  
 valuation, 211  
*Installation* of officers, 555  
*Interference* of sodium bicarbonate in the testing of pancreatin, 941  
*Intestinal secretions*, source of alkalinity, 432  
*Iod-benzoinform*, 156  
 formic acid, 156  
*Iodglidine*, 157  
*Iodides, alkali*, detection of nitrates, 261  
*Iodil*, 157  
*Iodine*, determination in the crude drug, 262  
 important product of Japanese industry, 261  
 soap, 117  
 therapeutic action of violet-colored and brown solution in chloroform, 262  
 tincture of, bottle for its preparation, 131  
*Iodized liquid petrox*, 1034  
*Iodofan*, 157  
*Iodo-ferrated cod-liver oil*, cause and prevention of darkening, 104  
*Iodoform bougies*, formula, 123  
 cotton and gauze, 68  
 gauze, formula, 67  
 sulphur, definite chemical compound, 349  
*Iodomenin*, 157  
*Iomacolate*, 157  
*Ionium*, new radio-active body, 298  
*Ipecac*, alkaloid-free South American variety, 215  
 precautions in estimation of emetine, 215  
*Ipomoea purpurea*, chemical examination, 202  
*Ipranol*, 203  
*Iprulic acid*, 203  
*Iron*, a new and very sensitive reaction, 292  
 albumen compounds, 846  
 borides of, preparation and properties, 268  
 citro-compounds of, position of the iron, 293  
 compound mixture, formula, 103  
 masked, series of complex salts, 293  
 peptone compounds, 847  
 reduced, methods of assay, 291  
 volumetric determination in ferric compounds, 292  
*Isoamygdalin*, preparation and conversion into prulaurasin, 409  
*Isoterpenes* of Flawitzky, identity with the hydrocarbons designated as limonenes, 307

J.

*Jaborandi leaves*, 174  
*Jalap resin*, criticism of the pharmacopœial tests of identity and quality, 115  
*Japanese angelica oil*, characters and constants, 312  
*Jet*, its origin, 270  
*Johore ipecacuanha*, botanical source, 214  
*Jones, H. W.*, Notes on Syrup of Hypophosphites and Syrup of Calcium Lactophosphate, 869

*Juice, lemon*, extraction, 121  
*Juices, fruit*, concentrated, production and characters, 121  
 prohibitory decisions regarding salicylic acid as preservative, 120  
*Juniper oil*, 326

## K.

*Kaemmerer, W. F.*, Harmful Effects of Our Pharmacy Laws, 743  
*Kalish, Julius*, obituary notice, 1083  
*Kalvo nuts*, poisonous properties, 249  
*Kaolin*, cataplasm of, formula satisfactory, 69  
 points for its preparation, 69  
*Kebler, L. F.*, Commercialism in Drugs, 597  
 Prescription Nostrums, 570  
 remarks as delegate of the Department of Agriculture, 446  
 Supplementary Report of Committee on Drug Market, 775  
 The Food and Drugs Act as an Educator, 659  
 and *V. K. Chestnut*, The Drug Collection at Washington, 1070  
*V. K. Chestnut*, The National Museum in Drug Research, 935  
*Keratin coated pills*, Unna formula, 109  
*Ketyn*, 157  
*Kirchgassner, W. C.*, Useful Formulas for Useful People, 1016  
*Klein, Nicolas*, obituary notice, 1083  
*Klonein*, 158  
*Kobushi oil*, chemical constituents, 330  
*Koch, J. A.*, election as associate on Committee on Pharmaceutical Education and Legislation, 705  
*Kola nuts*, constituents, 228  
*Kolatin*, characters and function in seeds, 414  
 preparation, yield and pharmacological activity, 414  
*Kortol*, 158  
*Kraemer, Henry*, remarks on the subject of spices, 578  
 Some of the Distinguishing Morphological Characters of Belladonna and Scopola, 819  
 The Teaching of Pharmacognosy, 672  
*Kremers, Edward*, election as historian, 1071  
 report of the historian, 1071  
 Some Pharmaceutical Book-plates, 1070  
 The Apothecary and Related Characters in Jost Amman, 1070  
*Kyroscope*, improved construction, 50  
*Kyphi*, 158

## L.

*Label moistener*, simple device, 63  
*Laboratory test solutions*, preservation, 93  
*Lacrothym*, 158  
*Lactoferran Odier*, 431  
*Ladish, E. H.*, election as secretary of Section on Commercial Interests, 601  
*Lard*, detection of foreign fats, 352  
*Lascoff, J. Leon*, The Professional and Commercial Pharmacist, 1054  
*Lasiosophones*, South African species, 186  
*Lavender oil*, influences concerned in the ester-content, 328  
*LaWall, C. H.*, election as secretary of Section of Pharmaceutical Education and Legislation, 705  
 report of secretary of Section on Pharmaceutical Education and Legislation, 606  
*Lawsonia, alba*, constituents of seeds, 236  
*Leaf tinctures*, identification and distinction from root tinctures, 130

- Leaves, belladonna, Austrian, scopola atropoides**  
 the adulterant, 196  
 false, report on microscopic examination, 196  
 substitution by poke leaves, 195  
 buchu, new variety, 227
- Leciferrin, 158**
- Lecithin, bacteriolytic properties, 434**  
 not a definite compound, 434  
 preparation from bone-marrow, 434  
 problematic utility as a medicament, 434
- Lemon juice, extraction, 121**  
 oil, adulterations, 329  
 adulteration with petroleum, 329
- Lenice paste, 158**
- Lenicet, 158**
- Letter from Philip C. Candidus, 458**  
 of F. E. Stewart relative to patents and trade marks, 705  
 relative to the work of the committee on N. F., 464  
 to president and members of the A. Ph. A. from S. A. D. Sheppard, 457
- Licorice powder, compound, objection to sweet components, 113**  
 root, Asiatic, superior quality, 241
- Light bismuth subnitrate, superiority over the heavy variety, 289**  
 petroleum, 202
- Lime water, 102**  
 a method of preparing, that insures conformity with the U. S. P. requirements, 1033
- Linaria vulgaris, glucosidal, constituents, 194**
- Linden flowers, 174**
- Liniment, ammonia, snow white and permanent, 1030**  
 camphor, estimation of camphor by means of polariscope, 91  
 variations in camphor content, 91  
 turpentine, preparation, 92
- Linimenta, 90**
- Linimentum ammoniz, snow white and permanent, 1030**  
 saponato-camphoratum, improved formula, 92
- Lippia scaberrima, proximate, constituents, 199**
- Liquidambar styraciflua, 172**
- Liquid soap, 117**  
 formulas, 117
- Liquor aluminii acetic, to secure stability, 98**  
 antisepticus, U. S. P. VIII, unsatisfactory flavor, 99  
 bismuthi, B. P., formula, 99  
 cresolis saponatus, G. P. IV, formula, 100  
 cresolis compositus, B. P. C., bactericidal value, 99  
 glycerinatus, formula, 100  
 ferri albuminati, 96  
 from milk, 97  
 peptonati, 95  
 cum mangano, 96  
 cum mangano arseno et strychnina, 96  
 cum mangano et arseno, 96  
 potassii arsenitis, notes on, 901  
 variation in appearance, 102
- Liquores, 93**
- List, alphabetical, of members, 1135**  
 alphabetical, of names of members from whom money has been received by the treasurer for annual dues or certificates from July 1, 1907, to July 1, 1908, 1073  
 of members, alphabetical, 1135  
 residing in foreign countries, 1133  
 who have been dropped from the roll for non-payment of dues, 1178  
 died since publication of last report, 1177  
 resigned, 1176  
 whose residence is unknown, 1134
- List of officers of the Association since its organization, xi**  
 Council since its organization, xvii  
 past and present, of the Sections, xviii  
 topics for discussion, 591
- Lithium, apparent production from copper, 276**
- Lisolein, 158**
- lobelia inflata, 172**
- Local committee of arrangements for 1908 meeting, 460**
- Lohmann, H. J., report of committee on weights and measures, 538**
- Long leaf pine oil, terpineol constituents, 335**
- Looch blanc, 74**
- Lord, Thomas, obituary notice, 1083**
- Luesan, 158**
- Lusby, R. H., obituary notice, 1083**
- Lutecium, a new element split from Marignac's ytterbium, 280**
- Lycopodium, estimations of impurities and sophistication, 181**
- Lyon, George C., obituary notice, 1083**
- Lyons, A. B., Alcohol Table to Facilitate Rapid Approximate Determination of Alcohol by Apparent Specific Gravity, 906**  
 Notes on Liquor Potassii Arsenitis, 901
- Lyringbin, 159**
- M.**
- Mace, color test for distinction of Bombay from Banda drug, 189**
- Machine, mixing, universal, for emulsions, 54**
- Magma magnesiae, 103**
- Magnesium carbonate, silica a common impurity, 278**  
 citrate solution, preparation, 102  
 silicide, composition and properties, 269
- Magnolia oil, properties of a Japanese product, 330**
- Magoffin, A. E., Here and There, 564**
- Maltyl, 159**  
 preparations, 159
- Mamminum, 159**
- Manganese citrate, conversion into soluble double salts, 375**
- Manila elemi, source and characters, 243**
- Maqui berries, used to color wines, 229**
- Maracaibo simaruba bark, substitution of stem-bark for root bark, 227**
- Maretine, 159**
- Masked iron, series of complex salts, 293**
- Mason, H. B., election as chairman of Section on Commercial Interests, 601**  
 Pharmacy Facing a Crisis, 645  
 Some Common Errors in Business Accounting, 586
- Massa urethralis c. argenti nitr., Unna, 124**  
 Unna, 124
- Massage ointment or toilet cream, 972**
- Mavrodapluire wine, production in Greece, 231**
- Maya, 431**
- Mayo, C. A., report of committee on publicity, 532**  
 delegates to the National Wholesale Druggists' Association, 531
- Mayoferin, 159**
- McCorkle, F. W., The Management of a Retail Drug Store, 583**
- McGill, F. T., The Qualifications for Licensure Required by Law Determine the Standard of Pharmaceutical Education and Amendment of Pharmacy Laws, 707**
- Measuring funnel, automatic, 34**
- Meat extract, detection of yeast, 79**
- Medeola virginiana, 172**
- Medicated soaps, formulas, 116, 117**
- Medicinal and poisonous plants of California, brief notes, 172**  
 chemistry, effect of exposure to greatly reduced temperatures, 258  
 plants of North America, description, 172  
 soaps, efficient substitute for eunatrol, etc., 115

- Meeker, Geo. H.*, The Next Step—A Practical Plan for the Professional Advancement of Pharmacists, 667
- Meisner, F. W., Jr.*, election as member of Council, 475
- Melting-point thermometer, construction, 52
- Menthyl-eucalyptol soap, 117
- Mercurial ointment, extinction of metallic globules, 137
- Mercuric bi-bromide, preparation, characters and compounds, 285
- cyanide, economical preparation, 273
- simple total analysis, 272
- oxycyanide, commercial variability, 273
- probable superiority as an antiseptic of the impure salt over the pure salt of G. P. supplement, 273
- peroxide, method of preparation, 287
- Mercurous chloride, new method of preparation, 285
- Mercury, glycerophosphates of, preparation and composition, 356
- ointment, assay, 137
- purification, 283
- volumetric estimation as iodate, 284
- Metacresolantylol, 159
- Metallic copper, precipitation, 282
- sodium, method of pulverization, 274
- Methylcitrilalicylic acid, 160
- Mexican scammony, identification as *Orizaba jalap*, 203
- Milch-maltyl, 159
- Milk, detection of added water, etc., by the freezing-point and specific gravity, 429
- detection of hydrogen dioxide, 430
- determination of added water by the freezing-point, 428
- estimation of germs by means of indigo-carmine, 429
- mixtures for infant-feeding, conditions to be met in their preparations, 429
- pasteurization insufficient to kill the tubercle bacillus, 430
- simple test to determine whether boiled or raw, 430
- sugar, detection of saccharose and glucose by the fermentation test, 367
- Miller, Jacob A.*, obituary notice, 1083
- Mineral oils, detection in vegetable oils with commercial picric acid, 305
- Minerals, radio-active, lithium a decomposition product of copper by radium emanation, 299
- presence of lithium, 299
- Minium, examination, 288
- improved method of examination, 287
- use of hydrogen dioxide for its examination, 288
- Minor, Dr. J. G.*, greeting from Garland Co. Med. Society, 522
- Minutes of First Session, 443
- Second Session, 473
- Third Session, 514
- Fourth Session, 515
- Fifth Session, 515
- Sixth Session, 515
- Seventh Session, 515
- Eighth Session, 515
- Ninth Session, 515
- Tenth Session, 515
- Eleventh Session, 515
- Twelfth Session, 533
- Section on Commercial Interests, 558
- Historical Pharmacy, 1069
- Pharmaceutical Education and Legislation, 602
- Practical Pharmacy and Dispensing, 945
- Scientific Papers, 759
- the Council, 459, 475, 516, 534
- Mirrors, copper, possible industrial production, 283
- Misture, 103
- Mittelbach, Wm.*, A Plea for Real Pharmacy, 1041
- election as second vice-president, 474
- Mixtures, Bonain's, 147
- Moerk, Frank X.*, Classification of the Quantitative Statements of the U. S. P. (8th Rev.), 800
- Moistener, label, simple device, 83
- Moisture, detection of mere traces, 259
- Mold, cosmetic, simple and inexpensive, 61
- Molybdenum, new color test, 295
- Morinda citrifolia, chemistry of root-bark, 215
- Morindadiol, 216
- Morindin, 216
- character and chemical relations, 421
- Morindon, 411
- Morocco and cyrenaica ammoniac, botanical source, 218
- Morphine and codeine, hydrolytic products of their halogen derivatives, 391
- determination in the stomach and intestinal contents, 390
- solubility in ether, 390
- solutions, sterilized, method of stability, 94
- Morphosan, 160
- Motion not to adopt recommendation to suspend by-laws for a year and to refer all business to the Council, 553
- relative to expense of special meeting of the committee on N. F., 465
- that it be the sense of the Council that every pharmacy, drug-store, public hospital or dispensary should be provided with a copy of the latest edition of the U. S. Pharmacopoeia and National Formulary, 516
- to accept offer of the C. D. V. A., to take care of the postage on the Ebert memorial volume, 459
- adopt ninth recommendation of committee on N. F., 539
- tenth recommendation of committee on N. F., 540
- amend article i, chapter 3 of the by-laws by striking out the figures 1000 and inserting in lieu thereof the figures 1200, 521
- appoint a committee to arrange details of transfer of the treasurer-ship, 521
- special committee of five on patents and trade-marks, 536
- special committee on relations with the National Association of Retail Druggists, 516
- appropriate \$300 for the permanent care of the graves of Albert E. Ebert and his wife, 517
- \$240 for use of committee on membership, 520
- \$100 for the use of committee on U. S. Pharmacopoeia, 521
- approve the fourth recommendation of committee on N. F., 539
- authorize committee on Ebert memorial volume to furnish copies to non-members for \$1.00, 460
- meeting of the committee on N. F., 464
- change the session of the section on historical pharmacy from Friday evening to Friday morning, 520
- continue committee on reorganization, 533
- extend fraternal greetings to the National Association of Retail Druggists, 516
- fix Oct. 1st, 1908, as the date on which the transfer of the treasurer's office is to be effected, 468
- furnish prize certificates to donors at nominal cost, 460
- grant Meyer Bros. Drug. Co. permission to use certain portion of text of N. F., 475
- instruct committee on publication to have reprints made of the report of the committee on national and state legislature, 520

- Motion to instruct committee on publication to insert list of past officers in 1908 volume of Proceedings, 521
- general secretary to take the necessary legal steps for the renewal of the corporate existence of the A. Ph. A., 468
- general secretary to turn over the check for \$1000 contributed to endowment fund by S. A. D. Sheppard to the treasurer-elect, 521
- nominating committee to bring in two sets of nominations, 468
- officers of A. Ph. A. to execute a quit-claim to Emily J. Koltz, 520
- name a committee to draft a rule of finance governing care of invested funds, 521
- nominate auxiliary committee on the N. F., 461
- order the payment of \$750 to chairman of committee on National Formulary, 520
- pay bill of chairman of committee on National Formulary for expenses of meeting of same committee, 534
- publish in the Bulletin abstracts of criticisms for the betterment of the N. F., 461
- recommend to the Association in general session the appointment of a committee on patents and trade-marks, 706
- reduce price of General Index, 460
- refer second recommendation of committee on weights and measures to Council, 539
- request committee on publicity to give widest possible circulation to resolution on advertisements of fraudulent medicines, 537
- send telegram of greeting to S. A. D. Sheppard, 457
- suspend by-law governing the meeting of section on commercial interests for the year 1909, 534
- which relates to section on scientific papers for the ensuing year, 521
- tender thanks to Thos. P. Cook and the committee of arrangements of the New York meeting for generous contribution to the endowment fund, 461
- Mould, suppository, cheap and convenient device for compression, 122
- extemporaneous device, 122
- Mucoferrin, 160
- Muir-pusma, attention to its aphrodisiac value, 185
- botanical classification, 186
- Mustard seed, cultivation in California, 233
- Myrrh, characterization of the gum, 244
- herrabol, chemical investigation, 243
- Myrtle oil, chemistry of myrtenol, 331
- N.
- Naphthalin soap, 117
- Narrow-necked vessels, stirrer for, 53
- Nastin-B., 160
- National Formulary, report of committee on, 487
- on the effect of age on preparations made according to, 494
- synopsis of recommendations of committee on 493
- syllabus committee, report of, 750
- Neocithin, 160
- kola pastilles, 160
- Neo-erbium, elementary identity, 281
- Neoform, 160
- New chromium sulphate, conditions of formation and properties, 290
- volatile alkaloids, isolation from a number of plants, 379
- oils, description, 309
- Niaouli oil, characters and constants, 331
- Nickel and cobalt, borides of, preparation and properties, 260
- sensitive method of separation from cobalt, 295
- Nicotiana glauca, Graham, poisoning of hogs by wild plants, 198
- Niece, F. K., Some Chemical Reasons Why Solutions deteriorate, 1050
- Nierembergia hippomanica, poisonous alkaloid a constituent, 199
- Nierembergine, 397
- Nigella species, alkaloidal constituents, 221
- Nitardy, F. W., Formulas Recommended for Introduction into the N. F., 1034
- Notes on Some Official Iodine Solutions, 1024
- Nitrate of mercury, ointment, B. P., chemistry, 137
- silver, removal of stains on the skin, 302
- Nitroglycerin, important assay in preparations, 355
- improvements in manufacture, 354
- Nitrous ether, concentrated, estimation of alcohol content, 348
- spirit of, utility of U. S. P. vii, process, 119
- variability of commercial product, 119
- Nizin, 161
- Nominating committee, report of, 473
- election of, 472
- Nomination of officers of Section on Commercial Interests, 590
- officers of Section on Pharmaceutical Education and Legislation, 667
- officers of Section on Scientific Papers, 804
- Noridal suppositories, 161
- Notes and suggestions on the cerates and ointments, 973
- on liquor potassii arsenitis, 909
- preparing syrupus aurantii, 950
- several new elixirs, 1026
- some official iodine solutions, 1024
- syrup of hypophosphites and syrup of calcium lactophosphate, 869
- the estimation of hydrastine, 836
- separation of emulsions for analysis, 838
- Notice of fraternal greetings from California, Denver and West Virginia pharmaceutical associations, 525
- Notices, obituary, 1083
- Nutmeg, oil of, chemical constituents, 332
- Nuts, kalvo, poisonous properties, 249
- kola, constituents, 228
- O.
- Obituary notices, 1083
- Officers-elect for 1909 1910, iv
- of Section on Commercial Interests, election of, 601
- Historical Pharmacy, election of, 1071
- Pharmaceutical Education and Legislation, election of, 705
- Practical Pharmacy and Dispensing, election of, 1090
- Scientific Papers, election of, 850
- the Association for 1908-1909, iii
- election of, 474, 516
- installation of, 555
- since its organization, xi
- Council, v
- election of, 534,
- since its organization, xvii
- Sections, past and present, xviii
- Oil, allyl-mustard, volumetric determination, 310
- American, pennyroyal, constituents, 333
- artemisia cina, terpineol a constituent, 312

- Oil, *asarum canadense*, yield and characters, 313  
*ayapana*, constituents, 313  
*bergamot*, adulterated specimens, 315  
 constants, adulterants, etc., 316  
 value of acid number for detecting adulteration, 313  
*betle*, new constituent, 316  
*birch leaf*, 310  
*bitter almonds*, substitution of benzaldehyde in commercial oils, 311  
*boldo leaves*, physical constants and constituents, 316  
*calomel*, or cream, formula, 104  
*camphor*, d-limonene a constituent, 317  
*canarium cumingii*, constants and composition, 319  
*cardamom*, Ceylon, sabinene a constituent, 320  
*carrot seed*, constants, 320  
*castor and benne oil*, contamination with zinc, 238  
 determination in oil mixtures, 263  
*cedarwood*, chemistry of the hydrocarbon constituent, 320  
*champaca*, source and composition, 321  
*chelonidionum*, 310  
*chenopodium*, superior anthelmintic value, 322  
*cinnamomum pedunculatum*, components and constants, 322  
*citronella*, dextro-rotary kind from Java, 322  
*clove leaves*, properties, 322  
*coriander*, products from worm-eaten and sound fruits, 322  
*curcuma*, chemistry, 323  
*East Indian sandalwood*, constants determined in samples of genuine oil, 340  
*English lavender*, abnormal specimen, 328  
*eucalyptus*, determination of eucalyptol by the aid of resorcinol, 324  
*French rose*, culture and extraction, 327  
*geranium*, adulteration with *gurjun* balsam, 325  
*ground ivy*, 310  
*ground-nut*, test for its presence in other oils, 326  
*guaiacum-resin*, 310  
*heracleum giganteum*, characters and yield from seed, 325  
*hyssop*, chemistry, 325  
*iodo-ferrated cod-liver*, causes and prevention of darkening, 104  
*ivy*, ground, 310  
*Japanese angelica*, character and constants, 312  
*juniper*, 326  
*juniperus chinensis*, chemistry, 327  
*juniperus phoenicea* constituents, 327  
*kobushi*, chemical constituents, 330  
*lavandula stochas*, constituents, 328  
*lavender*, influences concerned in the ester-content, 328  
*lemon*, adulterations, 329  
 adulteration with petroleum, 329  
*long leaf pine*, terpineol constituents, 335  
*magnolia*, properties of a Japanese product, 330  
*myrtle*, chemistry of myrtenol, 331  
*nardostachys jatamansi*, character and constants, 331  
*niaouli*, characters and constants, 331  
*nutmeg*, chemical constituents, 332  
*olive*, influence of oxygen, nitrogen, light and darkness, 363  
*orange*, sweet, 310  
*peach-kernel*, adulteration, 363  
*peppermint*, adulteration with petroleum, 333  
 English, temperature of menthol separation, 333  
*pilea*, sabinene the principal constituent, 334  
*resin*, *acaroides*, 309  
*rosemary*, English, optical rotation, 338  
*sage*, Syrian, constants, 339  
*sandalwood*, 811  
 pure, cause of abnormal characters, 340  
*santal*, adulterated oils and proposed standards for genuine oils, 341  
 modification of U. S. P. requirements, 339
- Oil, *savin*, citronellol a constituent, 342  
*sumbul*, characters and constants, 342  
*tarragon*, constituents, 342  
 para-methoxycinnamic aldehyde a constituent, 342  
*thyme*, estimations of phenol content by physical constants, 344  
 French, odorless crystalline deposit, 343  
*vitex agnus castus*, characters and constituents, 345  
*volatile*, *cardamine amara*, constituents, 319  
 of *lippia scaberrima*, characters, 330  
*magnolia*, *kobus*, composition and characters, 330
- Oils, *absinthe*, relative turbidity produced by diluting their alcoholic solutions with water, 312  
*eucalyptus*, California, development of the industry, 323  
*fixed*, acetone solubility a new physical constant, 350  
*mineral*, detection in vegetable oils with commercial picric acid, 305  
*pine*, varieties on the English market, 334  
*saponification number* of, a new saponification solution, 360  
*thyme* and *origanum*, commercial confusion as to source, 343  
*volatile*, new, description, 309  
 optical rotation, 308  
 question of adulteration, 308  
 terpenless, comparative antiseptic value, 309
- Ointment bases, 133  
 new formulas, 133  
 compound resorcinol, N. F., manipulation, 138  
 massage or toilet cream, 972  
*mercurial*, extinction of metallic globules, 137  
*mercury*, assay, 137  
 nitrate of mercury, B. P., chemistry, 137  
 sulphur, changes on keeping, 138  
 yellow mercuric oxide, 137
- Ointments, absorption experiments, 134  
*adrenine*, formulas, 136  
 convenient method of determining the constituent fat, 134  
 formulas of Dr. Unna, 134  
 sulphur, glycerin to facilitate preparation, 138  
 preparation, 138
- Oldberg, Oscar, election as president, 474  
 report of committee on national and state legislation, 712
- Olea, 103  
*Oleic acid*, presence, detection and removal of iron, 360
- Oleum benzoat. Unna, 103  
*cantharidini*-Unna, formula, 103  
*griseum*, formula, 104  
*gynocardiæ camphoratum*, Unna formula, 103  
*menthæ viridis*, characters and constants, 332  
*templinum*, preparation, 336
- Olive oil, influence of oxygen, nitrogen, light and darkness, 363  
 On the crystalline alkaloid of *calcanthus glaucus*, 805
- Opium assay, increase of morphine-precipitate on prolonged standing, 233  
 cultivation in India, 233
- Oranges, blood, artificial coloration and sweetening, 231  
 Order designed to suspend the by-laws for one year, 532
- Organic acids, determination in fruit juices, 370  
 wines, together with alcohol and glycerin, 371  
 new class of iron salts, 370
- Organotherapeutic products, 437  
*Origanum majoranoides*, 200  
*Orthosiphonis stamineus*, description and medicinal use of leaves, 200
- Osduigen, 161



- Osmium peroxide, action on iodides, 304  
quantitative separation, 304  
*Ossward, C.*, election as associate on committee on Pharmaceutical Education and Legislation, 705  
Ostanzin, 161  
Otto of rose, methods of adulteration, 337  
Ouabain and strophanthin, distinction of botanical source and chemical relation, 416  
Our pharmacopoeial rubrics, 759  
Oxytriiodophenolate of bismuth, 161  
Ozone, acid properties, 260
- P.
- Palladium, definite compounds with silicon, 303  
Palmatine, 395  
Panax repens, maxim, large percentage of non-toxic saponin in the rhizome, 218  
Paper, filter, presence of copper, 42  
Papers, filter, for pharmaceutical operations, 41  
Para caoutchouc, presence and characters of protein constituent, 247  
Paraffin, quality suitable for the paraffinprothesis, 306  
Para-parisol, 161  
Parathyreodin, 161  
Pardotheon, 161  
Parotoxin, 162  
Pasta albumin, alumin., Unna, 105  
caustica, Unna, 105  
lepismatica mitis, Unna, 105  
Unna, 105  
sulfuris cuticolor, Unna, 105  
pulfiformis, 138  
zinci comp., Unna, 105  
molis, Unna, 105  
oxydat., Unna, 105  
sulfurata, Unna, 106  
comp., Unna, 106  
rubra., Unna, 106
- Pastæ, 105  
Paste, dextrine, formula, 106  
Pastes, Unna, practical directions, 105  
Pastilles, neocithin-kola, 160  
vesol, 170  
*Patch, E. L.*, Report of Committee on Drug Market for Year Ending 1908, 765  
Patchouli, botanical sources of commercial sorts, 201  
Peach-kernel oil, adulteration, 363  
*Pease, A. V.*, List of Topics for Discussion, 591  
Pectin and protopectin, characterization, 366  
Pectolinarin, 194  
Pencils, colored marking, preparation, 220  
Pentosos, positive determination in urine, 369  
Pepper, black, ground, estimation of quality, 246  
microscopical and chemical examination, 245  
Peppermint oil, adulteration with petroleum, 333  
Pepsin and pancreatin, 432  
influence of colloidal metals on its digestive action, 432  
method of its potentiality in the gastric fluid, 431  
wine of, clarification with talc, 139  
Peran, 162  
Perbolin salve, 162  
Percarbonic acid, saline compounds, 271  
sodium salts of, 271  
Percolation, 34  
Percolator, pressure, for fluidextracts, 35  
Perfumery, manufacture by pharmacists, 140  
Peristaltin, 162  
Permanganic acid, isolation and characters, 291  
Permission granted to Bernard Fantus, M. D., to use abstracts of N. F. formulas, 462  
the N. A. R. D. to use abstracts of N. F. formulas, 462  
Pessaries, ichthyol, preparation, etc., 123  
solubility, 123  
Pessoid, 162  
Petroleum saponatum iodatum, 1034  
Petroleum ether, remarkable behavior of a certain sample, 306  
Pharmacist and physician, 1056  
Pharmacopœia nomenclature, 691  
Pharmacy facing a crisis, 645  
Pharmacy's unexplored field, 109  
Phenacodin, 162  
Phenol, action of sulphuric acid, 357  
and cresols, biological determinations, 358  
estimation of, 824  
Phenols, diphenylurea chloride as a reagent, 356  
Phenyphrin, 162  
Phosphoric acid, comparison of volumetric methods for the estimation of, 874  
determination of, 267  
iodometric method of estimation, 267  
utility of silver nitrate in the volumetric determination, 268  
Phosphorous acid, determination, 267  
Phosphorus nitride, preparation and properties, 266  
red, properties, 266  
Phthysoremid, 162  
Phytolacca decandra, 172  
Picrolonates, alkaloidal, additional description, 382  
Pilea oil, sabinene the principal constituent, 334  
Pill excipient, new, formula, 106  
Pills, ash percentages and time required for disintegration, 107  
excipients for salt prone to change, 106  
influence of diluents and excipients on their disintegration in the stomach and intestine, 107  
keratin coated, Unna, formula, 109  
manna as excipient, 106  
Pilocarpine hydrochloride, adulteration with sulphonal, 398  
pharmacologic action, 397  
Pilulæ, 106  
acid. arsenicos. kerat., Unna, 109  
calc. sulfurat. kerat., Unna, 109  
ferri sesquichlor. kerat., Unna, 110  
ichthyol. kerat., Unna, 110  
sapon. gynocard. kerat., Unna, 110  
sapon. gynocard. mitigat., Unna, 110  
Pine-needle oil soap, 117  
oils, varieties on the English market, 334  
Pinus jeffreyi, composition of the resin, 250  
sabiniana, chemical examination of oleoresin, 250  
suppositories and vaginal globes, 163  
Piper methysticum, chemical investigation, 246  
Pipette, safety, new sterilizable form, 33  
Plant pigments, 419  
Plantago species, aucubin a constituent, 192  
Plants containing cyanogenetic glucosides, experiments, 173  
immunity to disease, 171  
used by Indians and early Spanish settlers in California, 173  
Plasters and protective tissues, bacteriology, 73  
Platinum and palladium silicides, 270  
crucibles, cause of instability, 53  
oxidation, 303  
silicide, preparation and properties, 303  
Plecavol, 163  
Plethoral, 163  
Podocarpus chinensis, 253  
Podophyllum peltatum, 172  
Poison ivy fruit, presence of poison in the green fruit only, 244  
sumac, 244  
Poisonous star anise, seat of poison and simple method of identification, 223  
Polonium, preparation and behavior, 298  
Polygonum cuspidatum, emodin an abundant constituent of the rhizome, 189  
*Posey, H. G.*, Compound Solution of Sodium Phosphate, U. S. P., 980  
Dispensing and Laboratory Notes, 1034  
Potash, alcoholic, preparation, 274  
Potassium ammonozincate, preparation and properties, 282  
arsenite, formula of the dry salt, 301  
hydroxide, fused, percentage of KOH too high, 274

- Powder folder, convenient and simple form, 111  
device, 111  
insect, active constituent, 211  
valuation, 211  
licorice, compound, objection to sweet components, 113  
measure, adjustable, new device, 111  
Scotch horse, formula, 114
- Powdered drugs, microscopic examination, 177  
sophistication with exhausted material, 176
- Powders, combination divider and filler, 110  
dermatological, formulas, 111
- Precipitates, fine, filtration and extraction of, 43  
washing with syphon filter, 43
- Predigested foods, 432
- Prescription nostrums, 570
- President's address, Wm. M. Searby, 447
- Pressure percolator for fluidextracts, 35
- Proceedings of Alabama Pharm. Assoc., 19  
Arkansas Pharm. Assoc., 19  
California Pharm. Assoc., 19  
Colorado Pharm. Assoc., 20  
Connecticut Pharm. Assoc., 20  
Delaware Pharm. Assoc., 20  
Florida Pharm. Assoc., 20  
Georgia Pharm. Assoc., 20  
Idaho Pharm. Assoc., 21  
Illinois Pharm. Assoc., 21  
Indiana Pharm. Assoc., 21  
Iowa Pharm. Assoc., 21  
Kansas Pharm. Assoc., 22  
Kentucky Pharm. Assoc., 22  
Louisiana Pharm. Assoc., 23  
Maine Pharm. Assoc., 23  
Maryland Pharm. Assoc., 23  
Massachusetts Pharm. Assoc., 23  
Michigan Pharm. Assoc., 23  
Minnesota Pharm. Assoc., 24  
Mississippi Pharm. Assoc., 24  
Missouri Pharm. Assoc., 24  
Montana Pharm. Assoc., 25  
Nebraska Pharm. Assoc., 25  
New Hampshire Pharm. Assoc., 25  
New Jersey Pharm. Assoc., 26  
New York Pharm. Assoc., 26  
North Carolina Pharm. Assoc., 26  
North Dakota Pharm. Assoc., 27  
Ohio Pharm. Assoc., 27  
Oklahoma Pharm. Assoc., 28  
Oregon Pharm. Assoc., 28  
Pennsylvania Pharm. Assoc., 28  
Rhode Island Pharm. Assoc., 29  
South Carolina Pharm. Assoc., 29  
South Dakota Pharm. Assoc., 29  
State Pharm. Associations, 19  
Tennessee Pharm. Assoc., 30  
Texas Pharm. Assoc., 30  
Utah Pharm. Assoc., 31  
Vermont Pharm. Assoc., 31  
Virginia Pharm. Assoc., 31  
Washington Pharm. Assoc., 32  
West Virginia Pharm. Assoc., 32  
Wisconsin Pharm. Assoc., 32  
the Baltimore branch, 8  
Chicago branch, 10  
New England branch, 12  
local branches of the A. Ph. A., 8  
New York branch, 12  
Northern Ohio branch, 15  
Northwestern branch, 16  
Philadelphia branch, 17
- Program, proposed, for the fifty-sixth annual meeting, 463
- Propolis, characters and composition, 256
- Proposed budget for 1908-9  
program for the fifty-sixth annual meeting, 465
- Protagon, a body of constant chemical composition, 433
- Proteid iron solutions, improved formulas, 95
- Protein compounds with the heavy metals, 845
- Protoferrin, 163
- Prulaurasin, cyanogenetic relations, preparation and characters, 408
- Pseudobaptisin, hydrolytic products and derivatives, 475
- Pseudotheobromine, synthesis and products of oxidation, 397
- Ptyophagon, 163
- Public conveniences are good advertisements, 566
- Pulveres, 110
- Pulvis cuticular c. ichthyol, Unna, 112  
Unna, 112  
cutifricus, Unna, 112  
depilatorius, Unna, 112  
stypticus, Unna, 112
- Pump, water suction, construction, 44
- Punaria ascochingae, identification as brachycladus stuckerti, 212
- Pure amygdalin, 236  
dithymol, preparation, 344  
hydrogen sulphide, preparation, 264  
sandalwood oil, cause of abnormal characters, 340  
yeast cultures, significance in industrial fermentation processes, 779
- Purity of Some Official and Non-Official Drugs and Chemicals, 814
- Pycnometer, new, Construction Insuring Accurate determinations, 33
- Pyocyanase, 163
- Pyrenol, 164
- Pyretol, 211
- Pyridine, reactions, 400
- Q.
- Quassia, infusion of, 90
- Quietol, 164
- Quinine, advantage of chloroform in determinations, 386  
and cinchonine persulphates, preparation and properties, 387
- Quinine bisulphate, direct application of Kerner's and Liebig-Hesse's test, 387
- Quinophenol, new compounds, 400
- R.
- Racemic camphor, therapeutic identity with natural camphor, 318
- Radio-active minerals, lithium a decomposition product of copper by radium emanation, 299  
presence of lithium, 299
- Radiogenschlamm, 164
- Radiogur zylinders, 164
- Radium, redetermination of atomic weight, 297  
separation from radio-lead, 297
- Raffinose, occurrence in the leaves and twigs of *taxus baccata*, 368
- Raspberries, syrup of, ellagic acid cause of spontaneous turbidity, 127
- Raspberry syrup, detection of cherry juice, 127
- Raubenheimer, Otto*, Bismuthi Hydroxidum, 1030  
Linimentum Ammoniae, Snow-white and Permanent, 1030  
Safety Benzin, 1038
- Recovered alcohol, table for its convenient conversion into menstrua of required strength, 345
- Red phosphorus, properties, 266
- Reduced iron, methods of assay, 291
- Reflux condenser, new form, 47
- Remington, J. F.*, Commercial Training as a Factor in the Teaching of Pharmacology, 681  
election as chairman of Council, 534  
reply to addresses of Drs. Drennan and Minor, 523
- Report of auditing committee, 467  
chairman of Council on savings accounts and bonds, 466  
committee on credentials, 472  
drug market, 765  
supplementary, 775  
Ebert prize, 765

- Report of committee on national and state legislation, 712  
 Formulary, 487  
 parcels post, 591  
 president's address, 485  
     action on, 486  
 publication, 466  
 publicity, 532  
 organization, 546  
 status of pharmacists in the government employ, 513  
 the Bulletin, 517  
     Wm. Procter, Jr., monument fund, 533  
     time and place of next meeting, 524  
     U. S. Pharmacopoeia, 526  
     weights and measures, 538  
 to nominate members of the committee on unofficial standards, 521  
 delegates to the N. A. R. D., 545  
     National Wholesale Druggists' Association, 531  
     section on pharmacology of the A. M. A., 543  
 general committee on membership and reception, 540  
 national syllabus committee, 750  
 nominating committee, 473  
 reporter to the public press, 546  
 secretary of Council, 468  
     Section on Pharmaceutical Education and Legislation, 606  
 the board of canvassers, iv  
     general secretary, 483  
     historian, 1071  
     treasurer, 476  
 on the effect of age on preparations made according to the National Formulary, 494  
     progress of pharmacy, 1  
 supplementary, of committee on U. S. Pharmacopoeia, 530  
 Reporter to the public press, report of, 546  
 Resins, 115  
 Resolution declaring close and most amicable relationship between the A. Ph. A. and N. A. R. D., 570  
     endorsing the object and principles of a committee of 100 of the American Health League, 534  
     in regard to admission of crude and powdered drugs at the ports of entry of the U. S., 537  
     the importation of coca and its alkaloids and derivatives, 535  
     instructing the special committee on relations to the N. A. R. D., 534  
     of thanks for hospitality extended the Association, 538  
     on advertisements of fraudulent medicines, 536  
     a national department of health, 672  
     nomenclature to be used by manufacturers and jobbers of the drug trade, 692  
     the temperance question and the attitude that druggists should assume towards it, 535  
     relative to the importation of coca and its alkaloids, 644  
     to request the Surgeon-General of the U. S. P. H. & M. H. Service to include comments on the N. F. in digest of comments on the U. S. P., 534  
     urge the discontinuance of meaningless and incorrect titles of drugs and chemicals, 536
- Resolutions in regard to the liquor question, 657  
     on request for advancement in grade of pharmacists in the government service, 512  
     providing for the creation of committee on standards of non-official drugs and chemicals, 507  
 Resorbol, 164  
 Resorcinol, incompatibility with liquid petrolatum, 358  
     melting-point, 358  
 Rhachisan, 164  
 Rhamnosides, researches on several new kinds, 407  
 Rheum officinale, 190  
     rhaponticum, chemistry, 190  
 Rhodium, study of its halogen salts, 303  
 Rhubarb, ash determinations a possible criterion of commercial source, 191  
     Chinese, botanical source, 190  
     soap, 117  
 Rhubarbs, ash determinations of commercial sorts, 191  
 Rhus succedanea, localization of the fat in the fruits, 245  
 Riess, H. W., greetings from the Philippines, 457  
 Riga balsam, 140  
 Riley, Russell, obituary notice, 1083  
 Roehrig, A. M., remarks as delegate of the P. H. & M. H. S., 445  
 Roll of members, 1101  
 Root, calumba, false, characters, 225  
 Rose, otto of, methods of adulteration, 337  
 Rottlerin, oxidation products and derivatives, 423  
 Rubber articles, preserving liquids, 56  
     India, synthetic rubber *vs.* substitutes, 248  
     stoppers, with asbestos filling, 56  
     tubing, contrivance for suspension when not in use, 56  
 Rubidium-calcium sulphates, preparation and properties, 276  
 Rubus chamaemorus, medicinal and economic uses of the fruit, 237  
 Rules of finance, general, 1099  
 Rusby, H. H., Crude and Powdered Drugs at the Port of New York During the Year 1907-08, 783  
 Russian anise, adulteration with coriander, 218  
     ergot, compared with ergots produced elsewhere, 179
- S.
- Saccharated carbonate of iron, improved formula, 113  
 Saccharin, extraction and determination, 374  
     reaction with alkaloids, 374  
 Saccharometer, fermentation, convenient form, 368  
     simple form, 367  
 Safety benzin, 1038  
     pipette, new sterilizable form, 33  
 Saffron, composition, 183  
 Sakuranin, a new glucoside from prunus pseudocerasus, 416  
 Salicyl ichthyol soap, 117  
 Salicylic acid, detection of free phenol, 376  
     phenylhydrazon, preparation and characters, 377  
 Salol chloral, 164  
     soap, 117  
 Salophen and salacetol, luminosity in the dark on trituration, 377  
 Salt, artificial Carlsbad, necessity for pharmacopoeial tests, 139  
 Salts, barium, 278  
 Salve, perbolin, 162  
 Sambunigrin and prulaurasin, isomeric relations, 409  
 Sampling of drugs and preparation for assay, 831  
 Sandalwood, oil of, 811  
     pure, cause of abnormal characters, 340  
 Sander, Enno, The Superiority of Artificial Mineral Waters, 859  
 Santal oil, adulterated oils and proposed standards for genuine oils, 342  
     modification of U. S. P. requirements, 339

- Santonin, detection of adulteration with citric acid, 417
- Sapo cutifricius, Unna, 176
- glycerini c. vitello ovi, Unna, 116
- thiosinamin. unguinos, Unna, 116
- tuberculin. unguinos, Unna, 176
- Saponification number of oils, a new saponification solution, 360
- Saponin, microchemical detection in plant tissues, 417
- Sarsaparilla, 174
- Sarsaparillas, characters of distinction, 182
- Savin, oil of, citronellol a constituent, 342
- tops, 174
- Sayre, L. E., A Further Study of the Alkaloids of Gelsemium, 851
- The Value of Pharmaceutical Advisory Boards to State Boards of Health, 693
- Scammony, Mexican, identification as Orizaba jalap, 203
- Schmidt, Valentine, Unguentum Aquæ Rosæ, 971
- Schmitt, Geo. J. F., obituary notice, 1083
- Schneck, Charles, obituary notice, 1083
- Scopola japonica, characters and uses, 196
- versus belladonna, 196
- Scopolamine hydrobromide, preference of the optically inactive variety, 385
- Scotch horse powder, formula, 114
- Searby, W. M., election as member of Council, 475
- election as vice-chairman of Council, 534
- president's address, 447
- Secretary of Section on Pharmaceutical Education and Legislation, report of, 606
- Secretions, intestinal, source of alkalinity, 432
- Seed, mustard, cultivation in California, 233
- Seeds, cinchona, presence of alkaloids, 213
- Segura balsam, possible adulterant for copaiba, 241
- Sellagen tablets, 165
- Senega, adulteration with the stem-bases of the plant, 232
- Separator, double, useful device, 38
- funnel, improved tap, 38
- Serum gelatinæ, formula of Codex, 86
- Shelf bottles, how to keep in place, 60
- Shelves, window, self-adjusting bracket, 63
- Sheppard, S. A. D., election as honorary president for 1908-09, 475
- member of Council, 475
- letter to president and members of the A. Ph. A., 457
- report of treasurer, 476
- Shinn, James T., obituary notice, 1084
- Siberian and other pine-needle oil, santene a constituent, 335
- pine needle oils, constituents, 336
- Sic serum, 165
- Silk, spider, characters and possible utility, 257
- Silver ammonio-nitrate, crystalline form, 302
- nitrate, removal of stains on the skin, 302
- Simaruba bark, constituents, 227
- Maracaibo, substitution of stem-bark for root-bark, 227
- Simple elixir, 1028
- gas generator, device for analytical operations, 264
- thermostat, construction, 48
- Sneezeweed, dangerous plant to stock, 212
- Soap, cantharidin, 117
- chlorinated lime, 117
- iodine, 117
- liquid, 117
- formulas, 117
- menthol-eucalyptol, 117
- naphthalin, 117
- pine-needle oil, 117
- rhubarb, 117
- salicyl-ichthyol, 117
- säolol, 117
- sublimate-sodium chloride, 117
- Soaps, medicated, formulas, 116, 117
- medicinal, efficient substitute for eunatrol, etc., 115
- Soda, chlorinated, action on glass containers, 102
- solution of, 841
- water syrup, making large quantities, 125
- Sodium-arsenyl-tartrate, preparation and characters, 376
- cadodylate, alkalinity and consequent incompatibility of the commercial salt, 376
- dibromo-mercurate, a new compound recommended for medicinal use, 285
- metallic, method of pulverization, 274
- oleate, 361
- paraminophenolarsenicum, 165
- phosphate, compound solution of, U.S.P., 980
- precaution in cutting, 274
- salts of percarbonic acid, 271
- thymico-oxybenzoicum, 165
- Sodophthalyl, 165
- Solanum dulcamara, proximate constituents of the fruits, 195
- Solid opodeldoc, 92
- Solutio extracti visci albi physiologica, preparation, 101
- Solution, acid phosphates, N. F., unsatisfactory formula, 97
- chloride of antimony, formula, 98
- chlorinated soda, action on glass containers, 102
- ferrous carbonate, formula, 101
- hypodermic, sterilization, 93
- magnesium citrate, preparation, 102
- nascent ferrous carbonate, formula, 102
- of chlorinated soda, 841
- iron, manganese and pepsin, 1016
- sodium phosphate, compound, U.S.P., 980
- starch test, U. S. P. modification, 93
- Solutions, formaldehyde, influence of light and heat not very pronounced, 353
- morphine, sterilized, method of stability, 94
- protein iron, improved formulas, 95
- Somagen, 165
- Sombart, John E., obituary notice, 1084
- Some chemical reasons why solutions deteriorate, 1050
- common errors in business accounting, 586
- dosage forms of medicine, 1061
- interesting prescriptions, 1017
- of the distinguishing morphological characters of belladonna and scopolia, 819
- pharmaceutical book-plates, 1070
- Soporval, 165
- Soranjidiol 216
- Sorosin, 165
- Soryl, 166
- Soxhlet extractor, modification, 37
- Soxhlet's iron nutrient sugar, 166
- cacao, 166
- Spasmosit, 166
- Special committees of the association, vii
- Spider silk, character and possible utility, 257
- Spirit, camphor, 118
- estimation of camphor, 118
- nitrous ether, utility of U. S. P. VII process, 119
- variability of commercial product, 119
- Spiritus argenti nitrici, Unna, 119
- capillaris, Unna, 119
- Spirosal, 166
- Spurious henbane, a, occurrence in the American market, 197
- Stacey, Benjamin, obituary notice, 1084
- Standing committee of the association, vi
- Star anise, false, occurrence in French commerce, 223
- grouping of species according to the number of carpels, 221
- poisonous, seat of poison and simple method of identification, 223
- Starch grain, structure, 365
- test solution, U. S. P., modification, 93
- Statement of expenses of the Bulletin, 519
- Stewart, F. E., letter relative to patents and trade marks, 705

- Stibium sulphuratum aurantiacum, preparation, 301  
 Stili alcoholis, Unna, 120  
     resinosi, Unna, 120  
     unguinosi chrysarobini 30 per cent., Unna, 120  
         Unna, 120  
 Still, water, electric, efficient apparatus, 66  
     simple contrivance, 65  
*Stimson, Charlotte E.*, Massage Ointment or Toilet Cream, 972  
 Stirrer for narrow-necked vessels, 53  
 Stoppers, rubber, with asbestos filling, 56  
 Strophanthus, tincture of, identification, 132  
     variety most suitable for admission into the pharmacopœias, 205  
 Strychnine, elimination and detection in cases of poisoning, 398  
 Strychnos aculeata, chemical examination, 206  
 Syracit, 207  
 Sytrax obassia, S. et Z., constituents of the fruit, 207  
 Substone, 158  
 Sublimate-sodium chloride soap, 117  
 Sublimation, for small quantities, 52  
 Succinol, 166  
 Succinyl-salicylic acid, 166  
 Suction filter for precipitates, 43  
 Sugar, determination, 366  
     milk, detection of saccharose and glucose by the fermentation test, 367  
 Sulfidal, 166  
 Sulfoïd, 167  
 Sulfur colloidal, 167  
 Sulfacetin, 166  
 Sulphammonium, questions of its existence as a typical ammonium compound, 275  
 Sulphates, arsenic, compounds with the sulphates of potassium, calcium and lead, 301  
 Sulphur, detection in the free state, 263  
     igniting point in air, 263  
     ointment, changes on keeping, 138  
     ointments, glycerin to facilitate preparation, 138  
         preparation, 138  
 Sulphuric acid, product of the combustion of illuminating gas, 265  
 Sumac, poison, 244  
 Sumbul oil, characters and constants, 342  
*Suppan, L. R. A.*, election as associate on committee on pharmaceutical education and legislation, 705  
 Support, flask, forms, 55  
 Suppositories, addition of lanolin, 122  
     petrolatum, 121  
     adrenine, formula, 122  
     glycerin, modification for stock quantities, 122  
     nordal, 161  
 Suppository mould, cheap and convenient device for compression, 122  
     extemporaneous device, 122  
 Sweet elixir, 1026  
     red, 1027  
     orange oil, 310  
 Synopsis of recommendations of committee on National Formulary, 493  
 Synthetic adrenalin, 437  
     balsam of Peru, distinctions from the natural product, 238  
     camphor, review of patented processes, 317  
 Syphon, acid, for carboys, 61  
 Syrian sage oil, constants, 339  
 Syrup, chocolate, formula, 125  
     hydriodic acid, assay, 127  
     raspberries, ellagic acid cause of spontaneous turbidity, 127  
     raspberry, detection of cherry juice, 127  
     soda water, making large quantities, 125  
     tolu, B. P., improved manipulation, 128  
     wild cherry, how should it be prepared, 128  
 Syrups, aromatic, extraction of drug with syrup, 125  
     of the United States pharmacopœia, 951  
 Syrupus ferri, quininæ et strychninæ phosphatum, U. S. P. viii, 126  
     scillæ compositus, U. S. P. VII, faulty formula, 127  
 Syrupus thymi compositus, formula, 128  
     visci albi, formula, 128  
 T.  
 Tablet chemicals, 129  
     making, evolution and general instruction, 129  
 Tablets, seilagen, 165  
 Tannin, colorimetric estimation in white wines, 375  
 Tannismut, 167  
 Tannisol, 167  
 Tannothymal, 167  
 Tannyl, 168  
 Tarragon oil, constituents, 342  
     para-methoxycinnamic aldehyde a constituent, 342  
 Tartaric acid, detection in cider, 375  
     determination in presence of malic and succinic acids, 375  
 Taxikatin, a new glucoside in the leaves of *taxus baccata*, 417  
 Taxinæ, constituents of different plants belonging to this family, 251  
 Tea, determination of damage by sea-water, 230  
     flowers, use and superiority for making tea, 229  
 Telcan, 143, 168  
 Telegram from Cuban pharmacists, 457  
 Tenakel, adjustable, construction, 42  
 Terpeneless volatile oils, comparative antiseptic value, 399  
 Testing of bismuth salts for arsenic, 881  
 Tetrachlorotetrabromphenolphthalein, 386  
 Tetrathera polyantha, var. citrata, examination of volatile oil, 189  
 Tetrapol, 168  
 The acetic acid fluidextracts of the U. S. P., VIII, 883  
     apothecary and related characters in Jost Amman, 1090  
     call to health, 671  
     committee of 100 and the American Health League, 667  
     desirability of more elaborate pharmacopœial standards, 930  
     detection of phenol and cresotic acids in salicylic acid and its derivatives, 866  
     estimation of phenol, 824  
     food and drugs act as an educator, 659  
     management of a retail drug store, 583  
     national museum in drug research, 935  
     next step—a practical plan for the professional advancement of pharmacists, 697  
     opportunity of the hospital pharmacist in advancing the U. S. Pharmacopœia and National Formulary propaganda, 1046  
     percentage of moisture in commercial starches, 887  
     professional and commercial pharmacist, 1054  
     qualifications for licensure required by law determine the standard of pharmaceutical education and amendment of pharmacy laws, 707  
     superiority of artificial mineral waters, 859  
     teaching of pharmacognosy, 672  
     trade in spices and the druggist's share thereof, 565  
     value of pharmaceutical advisory boards to state boards of health, 693  
 Theobromine sodium, sodium acetate, preparation, 397  
 Theolactin, 168  
 Thermometer, melting-point, construction, 52  
 Thermostat, simple, construction, 48  
 Thiosulphocarbamates, general characters, 265  
 Thorium fluoride and thorium oxyfluoride, preparation and properties, 289  
 Thuja plicata, volatile constituents of the leaves and wood, 251  
 Thyreotheobromine, 168  
 Tillaria tritici, poisonous grain-smut, 180  
*Timberlake, Arthur*, obituary notice, 1084  
 Tinctura ferri pomata, preparation, 131  
     iodi, U. S. P., VIII, commercial quality, 132  
     lithantracis, Unna, 132  
     thymi composita, formula, 132

- Tincture, bensoin, with glycerin and rosewater, 130  
 iodine, bottle for its preparation, 131  
 strophanthus, identification, 132  
 Warburg's, formula for Belgian Formulary, 132
- Tinctures, 130  
 etc., convenient macerating bottle, 130
- Tiodine, 169
- Titration apparatus, new, 33
- Tomatoes, constituents, 198
- Tonquin butter, characters and constants, 364
- Top-milk, advantages for infant feeding and method of obtaining, 427
- Torreya myristica, 253
- Torulin, 169
- Trauben-selecto-ferment, 169
- Treasurer, report of, 476
- Treasurer's report, addendum to, 482
- Trimethylamine, convenient preparation for lecture demonstration, 399
- Trioxymethyl-anthraquinone-monomethyl ether, 216
- Truon, 169
- Tube filler, collapsible, 57  
 simple form, 58
- Tuberkel-rosin, 169
- Tuberkulose-diagnostikum Höchst, 169
- Tubing, rubber, contrivance for suspension when not in use, 56
- Turnips, characters of volatile oil from the outer peel, 234
- Turpentine liniment, preparation, 92
- Venice, detection of ordinary turpentine, 251
- U.
- Unguentum aquae rosae, 971  
 bismut. oxy-chlorat. Unna, 135  
 cantharidin., Unna, 135  
 casein. cadinat., Unna, 135  
 c. liantralo., Unna, 135  
 chrysarob. comp., Unna, 135  
 domestic. cadinat., Unna, 135  
 Unna, 135  
 durum album, 134  
 flavum, 134  
 hydrargy. oxydati flav., proposed formula for Ital. Pharm., 137  
 ichthargan, Unna, 135  
 lanæ anhydrosium, 133  
 hydrosium, 133  
 plumbi refrigerans, Unna, 135  
 pomadinum comp., Unna, 135  
 sulfur., Unna, 135  
 Unna, 135  
 pyrazolin. comp., Unna, 135  
 pyrogallol. comp., Unna, 136  
 refrigerans, Unna, 136  
 resorcin comp., Unna, 136  
 veratrinae, U. S. P. VIII, 139  
 viride c. lupum, Unna, 136
- Universal mixing machine, for emulsions, 54
- Unna pastes, formulas, 105  
 practical directions, 105
- Uranium tetraiodide, preparation and properties, 296
- Uranyl molybdate, new uranium compound, 296
- Urine, 441  
 estimation of acetone, 440  
 gold chloride a reagent for reducing substances, 439  
 impure nitric acid a source of error in albumen test, 441  
 method of detecting albumen, 440  
 simple method and apparatus for detecting the presence of acetone, 439  
 volumetric estimation of albumen, 440
- Useful formulas for useful people, 1016
- Utch, P. H., election as associate on Committee on Commercial Interests, 601
- V.
- Vacuum closet, new form, 48  
 distillation, apparatus for, 44

- Valerian, presence of saccharose confirmed, 912
- Vanderkleed, Chas. E., and Henry L. Berugan, Interference of Sodium Bicarbonate in the Testing of Pancreatin, 941
- Vanillin-hydrochloric acid, 418  
 preparation from guaiacol, 418
- Varicin, 169
- Vaseline, stringency of the sulphuric acid test, 306
- Vasoliments, preparation, 90
- Vegetable albumens, biological method of differentiation, 424  
 drugs, adulterations and substitutions, 174  
 some neglected plants, 173
- Velledol, 169
- Venice turpentine, detection of ordinary turpentine, 251
- Verbenalin, glucoside from verbenia officinalis, 418
- Veronal, 169  
 elixir of, 1016
- Vesol pastilles, 170
- Vessels, narrow-necked, stirrer for, 53
- Viscum album, alkaloidal constituent, 217
- Volatile oil, cardamine amara, constituents, 319  
 of lippia scaberima, characters 330  
 magnolia kobus, composition and characters, 330  
 oils, new, description, 309  
 optical rotation, 308  
 question of adulteration, 308  
 terpenes, comparative antiseptic value, 309
- Voss, George W., obituary notice, 1084
- W.
- Wakeman, Nellie A., The Phyto-Chemical Work of Henry Trimble, 1070
- Wangler, Conrad D., obituary notice, 1084
- Warburg's tincture, formula for Belgian formulary, 132  
 with aloes, 133
- Washer, bottle, construction, 60
- Water, aerated, distilled, production, 63  
 ammonia-free, efficient apparatus, 65  
 -bath, constant level, 47  
 bitter almond, increase of yield, 67  
 cherry laurel, 67  
 -jet blower, construction, 50  
 still, electric, efficient apparatus, 66  
 simple contrivance, 65  
 suction pump, construction, 44
- Waxes, characterization, 359
- Weber, Peter J., obituary notice, 1084
- Weinstein, Jos., Pharmacy's Unexplored Field, 1019
- Wells, Edwin H., obituary notice, 1084
- West African copals, varieties, solubilities and constituents, 253
- What is oil of juniper? 326
- Whelpley, H. M., election as treasurer, 517  
 Pharmacopoeia Nomenclature, 691  
 report of secretary of Council, 468
- White adrenaline ointment, 136  
 castile soap vs. coconut oil soap, objectionable distinctions, 176
- Wilbert, M. I., An Interesting Pharmacopoeia and Some Historical Hospital Formularies, 1069  
 Some Dosage Forms of Medicine, 1061  
 The Committee of 100 and The American Health League, 667
- Wild cherry syrup, how should it be prepared? 128
- Willels, C. E., The Trade in Spices and the Drug-gist's Share Thereof, 565
- Window shelves, self-adjusting bracket, 63
- Wine, acetylmethylcarbinol a product of its acetone fermentation, 231  
 mavrodaphne, production in Greece, 231  
 pepsin, clarification with talc, 139  
 -vinegar, glycerin content not a reliable criterion of quality and source, 371

## X.

Xaxaquin, 170  
Xeramatbolusgaze, 170  
Xerosin, 170

## Y.

Yeast culture, pure, significance in industrial fermentation processes, 179  
Yellow mercuric oxide, ointment, 137  
Yoghurt, 431  
tablets, 431

Yohimbi bark, chemical tests, 216

Yohimbine, 216

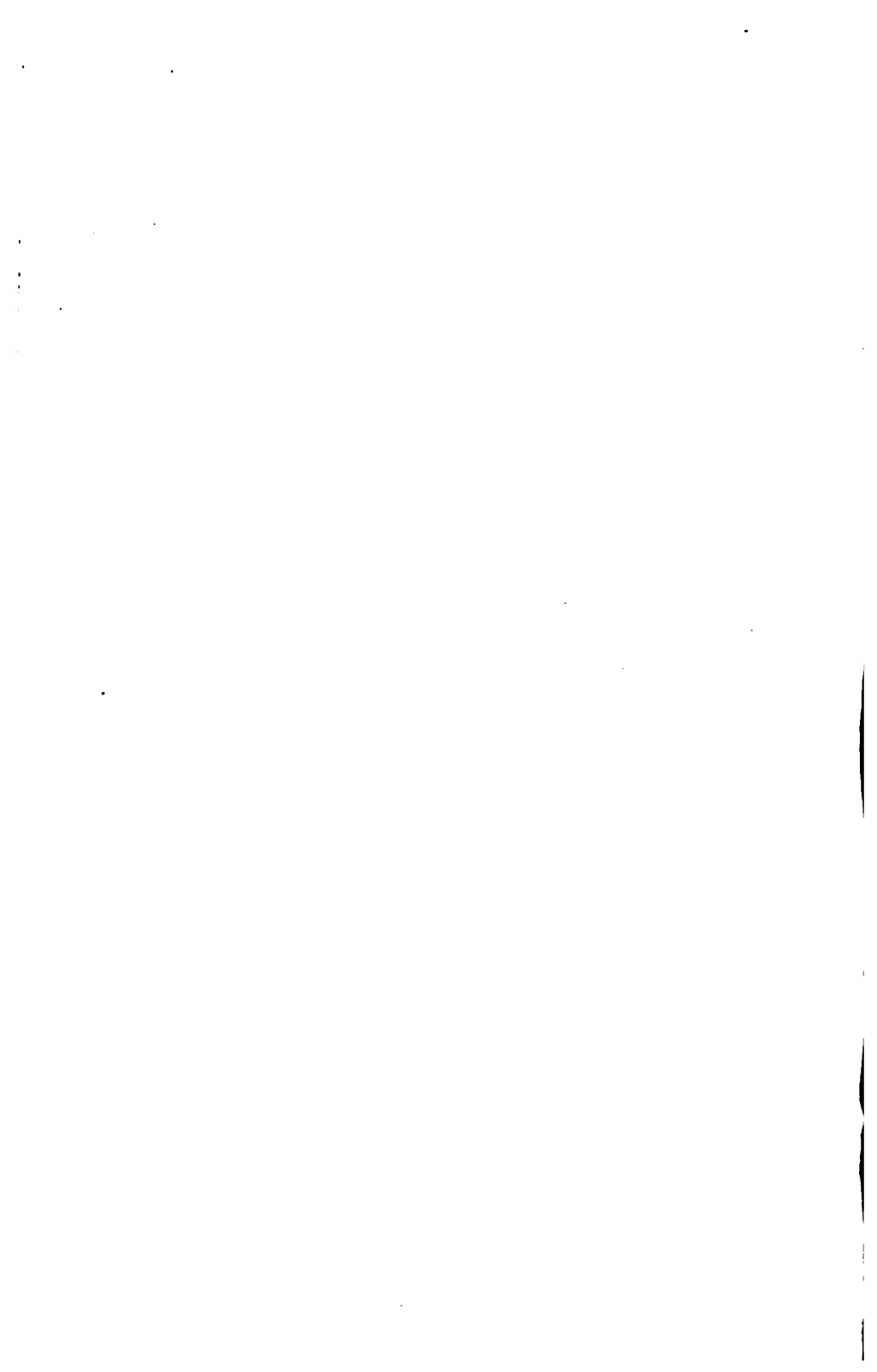
characteristic reactions, 398

Yttrium earths, separation by fractional crystallisation of their bromates, 279

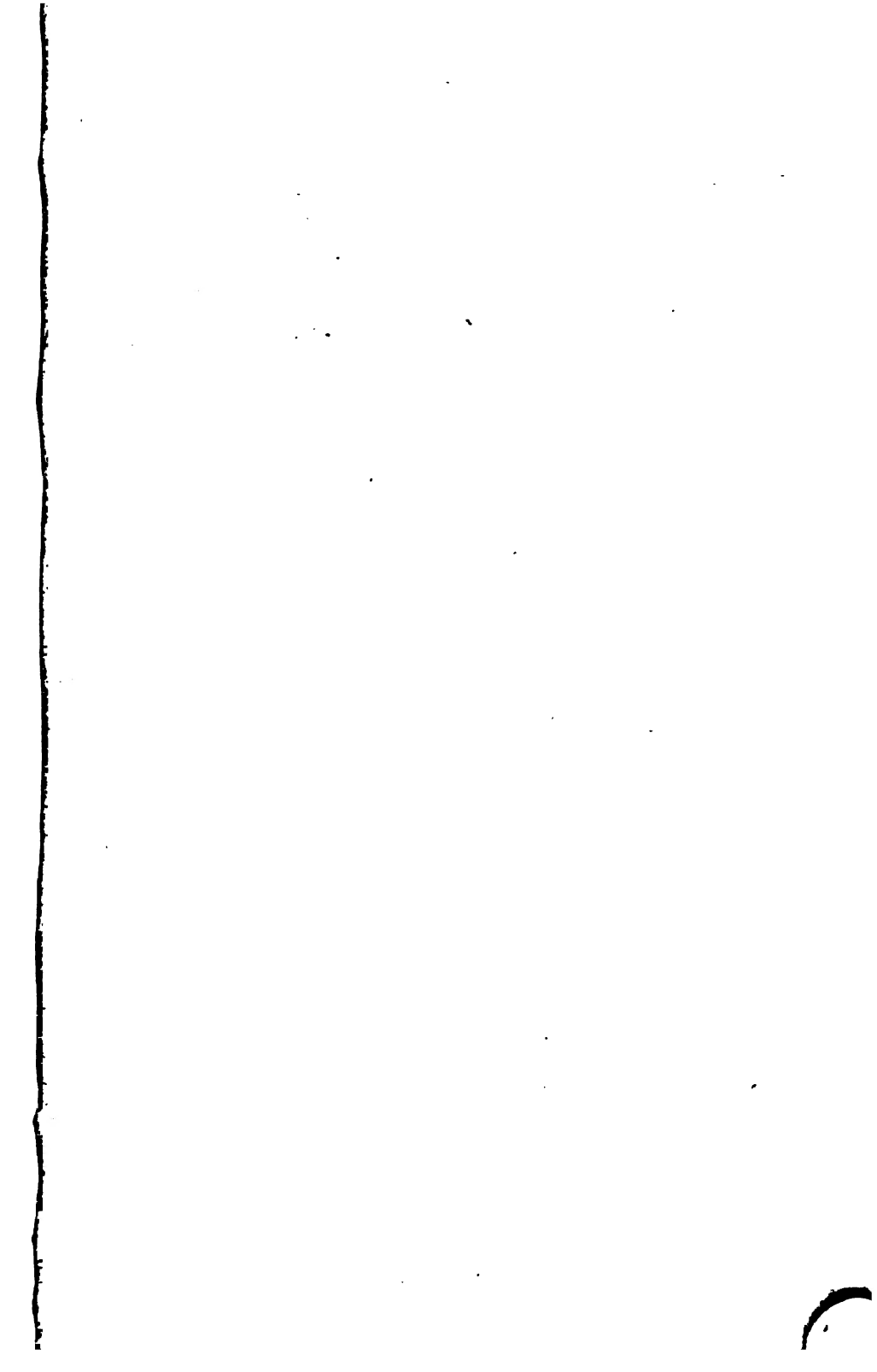
group of rare earths, study of terbium and dysprosium compounds, 279

## Z.

Zinc, acid glycerophosphate, 356  
volumetric determination, 281







~~RU 543C~~

1908

259T

STON, MASS.